



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL
TRAINING AT THE UNIVERSITY OF HELSINKI 2005–2010

RC-Specific Evaluation of ATM – Center of Excellence in Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change

Seppo Saari & Antti Moilanen (Eds.)



Evaluation Panel: Natural Sciences

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Title: International Evaluation of Research and Doctoral Training at the University of Helsinki 2005–2010 : RC-Specific Evaluation of ATM – Center of Excellence in Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change		Type of publication: Evaluations
Summary: Researcher Community (RC) was a new concept of the participating unit in the evaluation. Participation in the evaluation was voluntary and the RCs had to choose one of the five characteristic categories to participate. Evaluation of the Researcher Community was based on the answers to the evaluation questions. In addition a list of publications and other activities were provided by the TUHAT system. The CWTS/Leiden University conducted analyses for 80 RCs and the Helsinki University Library for 66 RCs. Panellists, 49 and two special experts in five panels evaluated all the evaluation material as a whole and discussed the feedback for RC-specific reports in the panel meetings in Helsinki. The main part of this report is consisted of the feedback which is published as such in the report. Chapters in the report: 1. Background for the evaluation 2. Evaluation feedback for the Researcher Community 3. List of publications 4. List of activities 5. Bibliometric analyses The level of the RCs' success can be concluded from the written feedback together with the numeric evaluation of four evaluation questions and the category fitness. More conclusions of the success can be drawn based on the University-level report.		
RC-specific information:		
Main scientific field of research: Natural Sciences	RC-specific keywords: Atmosphere, biosphere, aerosols, air chemistry, meteorology, climate change, greenhouse gases, volatile organic compounds, boreal ecosystems, feedbacks, carbon cycle, nitrogen cycle, water cycle, multi-scale modeling, field measurements, health effects, tree ecophysiology, dynamic meteorology, biogeochemistry	
Participation category: 1. Research of the participating community represents the international cutting edge in its field		
RC's responsible person: Kulmala, Markku		
Keywords: Research Evaluation, Meta-evaluation, Doctoral Training, Bibliometric Analyses, Researcher Community		

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Foreword

The evaluation of research and doctoral training is being carried out in the years 2010–2012 and will end in 2012. The steering group appointed by the Rector in January 2010 set the conditions for participating in the evaluation and prepared the Terms of Reference to present the evaluation procedure and criteria. The publications and other scientific activities included in the evaluation covered the years 2005–2010.

The participating unit in the evaluation was defined as a Researcher Community (RC). To obtain a critical mass with university-level impact, the number of members was set to range from 20 to 120. The RCs were required to contain researchers in all stages of their research career, from doctoral students to principal investigators (PIs). All in all, 136 Researcher Communities participated in this voluntary evaluation, 5857 persons in total, of whom 1131 were principal investigators. PIs were allowed to participate in two communities in certain cases, and 72 of them used this opportunity and participated in two RCs.

This evaluation enabled researchers to define RCs from the “bottom up” and across disciplines. The aim of the evaluation was not to assess individual performance but a community with shared aims and researcher-training activities. The RCs were able to choose among five different categories that characterised the status and main aims of their research. The steering group considered the process of applying to participate in the evaluation to be important, which led to the establishment of these categories. In addition, providing a service for the RCs to enable them to benchmark their research at the global level was a main goal of the evaluation.

The data for the evaluation consisted of the RCs’ answers to evaluation questions on supplied e-forms and a compilation extracted from the TUHAT – Research Information System (RIS) on 12 April 2011. The compilation covered scientific and other publications as well as certain areas of scientific activities. During the process, the RCs were asked to check the list of publications and other scientific activities and make corrections if needed. These TUHAT compilations are public and available on the evaluation project sites of each RC in the TUHAT-RIS.

In addition to the e-form and TUHAT compilation, University of Leiden (CWTS) carried out bibliometric analyses from the articles included in the Web of Science (WoS). This was done on University and RC levels. In cases where the publication forums of the RC were clearly not represented by the WoS data, the Library of the University of Helsinki conducted a separate analysis of the publications. This was done for 66 RCs representing the humanities and social sciences.

The evaluation office also carried out an enquiry targeted to the supervisors and PhD candidates about the organisation of doctoral studies at the University of Helsinki. This and other documents describing the University and the Finnish higher education system were provided to the panellists.

The panel feedback for each RC is unique and presented as an entity. The first collective evaluation reports available for the whole panel were prepared in July–August 2011. The reports were accessible to all panel members via the electronic evaluation platform in August. Scoring from 1 to 5 was used to complement written feedback in association with evaluation questions 1–4 (scientific focus and quality, doctoral training, societal impact, cooperation) and in addition to the category evaluating the fitness for participation in the evaluation. Panellists used the international level as a point of comparison in the evaluation. Scoring was not expected to go along with a preset deviation.

Each of the draft reports were discussed and dealt with by the panel in meetings in Helsinki (from 11 September to 13 September or from 18 September to 20 September 2011). In these meetings the panels also examined the deviations among the scores and finalised the draft reports together.

The current RC-specific report deals shortly with the background of the evaluation and the terms of participation. The main evaluation feedback is provided in the evaluation report, organised according to the evaluation questions. The original material provided by the RCs for the panellists has been attached to these documents.

On behalf of the evaluation steering group and office, I sincerely wish to thank you warmly for your participation in this evaluation. The effort you made in submitting the data to TUHAT-RIS is gratefully acknowledged by the University. We wish that you find this panel feedback useful in many ways. The bibliometric profiles may open a new view on your publication forums and provide a perspective for discussion on your choice of forums. We especially hope that this evaluation report will help you in setting the future goals of your research.

Johanna Björkroth
Vice-Rector
Chair of the Steering Group of the Evaluation

Steering Group of the evaluation

Steering group, nominated by the Rector of the University, was responsible for the planning of the evaluation and its implementation having altogether 22 meetings between February 2010 and March 2012.

Chair

Vice-Rector, professor **Johanna Björkroth**

Vice-Chair

Professor **Marja Airaksinen**

Chief Information Specialist, Dr **Maria Forsman**

Professor **Arto Mustajoki**

University Lecturer, Dr **Kirsi Pyhälä**

Director of Strategic Planning and Development, Dr **Ossi Tuomi**

Doctoral candidate, MSocSc **Jussi Vauhkonen**

Panel members

CHAIR

Professor Jan-Otto Carlsson

Materials science in chemistry and physics, nanotechnology, inorganic chemistry
Uppsala University, Sweden

VICE-CHAIR

Professor Jan van Leeuwen

Computer science, information technology
University of Utrecht, the Netherlands

Professor Caitlin Buck

Probability and statistics, archeology, palaeoenvironmental science
University of Sheffield, Great Britain

Professor David Colton

Mathematics, inverse problems of acoustic and electromagnetic scattering
University of Delaware, USA

Professor Jean-Pierre Eckmann

Mathematics, dynamical systems, mathematical physics
University of Geneva, Switzerland

Professor Ritske Huismans

Geosciences, geodynamics
University of Bergen, Norway

Professor Jukka Jurvelin

Medical physics and engineering
University of Eastern Finland

Professor Lea Kauppi

Environmental sciences, water research
The Finnish Environment Institute, Finland

Professor Riitta Keiski

Chemical engineering, heterogeneous catalysis, environmental technology, mass and heat transfer processes
University of Oulu, Finland

Professor Mats Larsson

Experimental molecular physics, chemical dynamics, molecular spectroscopy, astrobiology
Stockholm University, Sweden

Professor Holger Stark

Medicinal, organic and pharmaceutical chemistry, pharmacology
Johann Wolfgang Goethe Universität, Germany

The panel, independently, evaluated all the submitted material and was responsible for the feedback of the RC-specific reports. The panel members were asked to confirm whether they had any conflict of interests with the RCs. If this was the case, the panel members disqualified themselves in discussion and report writing.

Added expertise to the evaluation was contributed by the members from the other panels.

Experts from the Other Panels

Professor Barbara Koch, from the Panel of Biological, Agricultural and Veterinary Sciences

Professor Peter York, from the Panel of Medicine, Biomedicine and Health Sciences

EVALUATION OFFICE

Dr Seppo Saari, Doc., Senior Adviser in Evaluation, was responsible for the entire evaluation, its planning and implementation and acted as an Editor-in-chief of the reports.

Dr Eeva Sievi, Doc., Adviser, was responsible for the registration and evaluation material compilations for the panellists. She worked in the evaluation office from August 2010 to July 2011.

MSocSc Paula Ranne, Planning Officer, was responsible for organising the panel meetings and all the other practical issues like agreements and fees and editing a part the RC-specific reports. She worked in the evaluation office from March 2011 to January 2012.

Mr Antti Mollanen, Project Secretary, was responsible for editing the reports. He worked in the evaluation office from January 2012 to April 2012.

TUHAT OFFICE

Provision of the publication and other scientific activity data

Mrs Alja Kaltera, Project Manager of TUHAT-RIS served the project ex officio providing the evaluation project with the updated information from TUHAT-RIS. The TUHAT office assisted in mapping the publications with CWTS/University of Leiden.

MA Liisa Ekebon, Assisting Officer, served in TUHAT-RIS updating the publications for the evaluation. She also assisted the UH/Library analyses.

BA Liisa Jäppinen, Assisting Officer, served in TUHAT-RIS updating the publications for the evaluation.

HELSINKI UNIVERSITY LIBRARY

Provision of the publication analyses

Dr Maria Forsman, Chief Information Specialist in the Helsinki University Library, managed with her 10 colleagues the bibliometric analyses in humanities, social sciences and in other fields of sciences where CWTS analyses were not applicable.

Acronyms and abbreviations applied in the report

External competitive funding

AF – Academy of Finland
TEKES - Finnish Funding Agency for Technology and Innovation
EU - European Union
ERC - European Research Council
International and national foundations
FP7/6 etc. /Framework Programmes/Funding of European Commission

Evaluation marks

Outstanding (5)
Excellent (4)
Very Good (3)
Good (2)
Sufficient (1)

Abbreviations of Bibliometric Indicators

P - Number of publications
TCS – Total number of citations
MCS - Number of citations per publication, excluding self-citations
PNC - Percentage of uncited publications
MNCS - Field-normalized number of citations per publication
MNJS - Field-normalized average journal impact
THCP10 - Field-normalized proportion highly cited publications (top 10%)
INT_COV - Internal coverage, the average amount of references covered by the WoS
WoS – Thomson Reuters Web of Science Databases

Participation category

Category 1. The research of the participating community represents the international cutting edge in its field.
Category 2. The research of the participating community is of high quality, but the community in its present composition has yet to achieve strong international recognition or a clear break-through.
Category 3. The research of the participating community is distinct from mainstream research, and the special features of the research tradition in the field must be considered in the evaluation.
Category 4. The research of the participating community represents an innovative opening.
Category 5. The research of the participating community has a highly significant societal impact.

Research focus areas of the University of Helsinki

Focus area 1: The basic structure, materials and natural resources of the physical world
Focus area 2: The basic structure of life
Focus area 3: The changing environment – clean water
Focus area 4: The thinking and learning human being
Focus area 5: Welfare and safety
Focus area 6: Clinical research
Focus area 7: Precise reasoning
Focus area 8: Language and culture
Focus area 9: Social justice
Focus area 10: Globalisation and social change

1 Introduction to the Evaluation

1.1 RC-specific evaluation reports

The participants in the evaluation of research and doctoral training were Researcher Communities (hereafter referred to as the RC). The RC refers to the group of researchers who registered together in the evaluation of their research and doctoral training. Preconditions in forming RCs were stated in the Guidelines for the Participating Researcher Communities. The RCs defined themselves whether their compositions should be considered well-established or new.

It is essential to emphasise that the evaluation combines both meta-evaluation¹ and traditional research assessment exercise and its focus is both on the research outcomes and procedures associated with research and doctoral training. The approach to the evaluation is enhancement-led where self-evaluation constituted the main information. The answers to the evaluation questions formed together with the information of publications and other scientific activities an entity that was to be reviewed as a whole.

The present evaluation recognizes and justifies the diversity of research practices and publication traditions. Traditional Research Assessment Exercises do not necessarily value high quality research with low volumes or research distinct from mainstream research. It is challenging to expose the diversity of research to fair comparison. To understand the essence of different research practices and to do justice to their diversity was one of the main challenges of the present evaluation method. Understanding the divergent starting points of the RCs demanded sensitivity from the evaluators.

1.2 Aims and objectives in the evaluation

The aims of the evaluation are as follows:

- to improve the level of research and doctoral training at the University of Helsinki and to raise their international profile in accordance with the University's strategic policies. The improvement of doctoral training should be compared to the University's policy.²
- to enhance the research conducted at the University by taking into account the diversity, originality, multidisciplinary nature, success and field-specificity,
- to recognize the conditions and prerequisites under which excellent, original and high-impact research is carried out,
- to offer the academic community the opportunity to receive topical and versatile international peer feedback,
- to better recognize the University's research potential.
- to exploit the University's TUHAT research information system to enable transparency of publishing activities and in the production of reliable, comparable data.

1.3 Evaluation method

The evaluation can be considered as an enhancement-led evaluation. Instead of ranking, the main aim is to provide useful information for the enhancement of research and doctoral training of the participating RCs. The comparison should take into account each field of science and acknowledge their special character.

¹ The panellists did not read research reports or abstracts but instead, they evaluated answers to the evaluation questions, tables and compilations of publications, other scientific activities, bibliometrics or comparable analyses.

² [Policies on doctoral degrees and other postgraduate degrees at the University of Helsinki.](#)

The comparison produced information about the present status and factors that have lead to success. Also challenges in the operations and outcomes were recognized.

The evaluation approach has been designed to recognize better the significance and specific nature of researcher communities and research areas in the multidisciplinary top-level university. Furthermore, one of the aims of the evaluation is to bring to light those evaluation aspects that differ from the prevalent ones. Thus the views of various fields of research can be described and research arising from various starting points understood better. The doctoral training is integrated into the evaluation as a natural component related to research. Operational processes of doctoral training are being examined in the evaluation.

Five stages of the evaluation method were:

1. Registration – Stage 1
2. Self-evaluation – Stage 2
3. TUHAT³ compilations on publications and other scientific activities⁴
4. External evaluation
5. Public reporting

1.4 Implementation of the external evaluation

Five Evaluation Panels

Five evaluation panels consisted of independent, renowned and highly respected experts. The main domains of the panels are:

1. biological, agricultural and veterinary sciences
2. medicine, biomedicine and health sciences
3. natural sciences
4. humanities
5. social sciences

The University invited 10 renowned scientists to act as chairs or vice-chairs of the five panels based on the suggestions of faculties and independent institutes. Besides leading the work of the panel, an additional role of the chairs was to discuss with other panel chairs in order to adopt a broadly similar approach. The panel chairs and vice-chairs had a pre-meeting on 27 May 2011 in Amsterdam.

The panel compositions were nominated by the Rector of the University 27 April 2011. The participating RCs suggested the panel members. The total number of panel members was 50. The reason for a smaller number of panellists as compared to the previous evaluations was the character of the evaluation as a meta-evaluation. The panellists did not read research reports or abstracts but instead, they evaluated answers to the evaluation questions, tables and compilations of publications, other scientific activities, bibliometrics and comparable analyses.

The panel meetings were held in Helsinki:

- On 11–13 September 2011: (1) biological, agricultural and veterinary sciences, (2) medicine, biomedicine and health sciences and (3) natural sciences.
- On 18–20 September 2011: (4) humanities and (5) social sciences.

³ TUHAT (acronym) of Research Information System (RIS) of the University of Helsinki

⁴ Supervision of thesis, prizes and awards, editorial work and peer reviews, participation in committees, boards and networks and public appearances.

1.5 Evaluation material

The main material in the evaluation was the RCs' self-evaluations that were qualitative in character and allowed the RCs to choose what was important to mention or emphasise and what was left unmentioned.

The present evaluation is exceptional at least in the Finnish context because it is based on both the evaluation documentation (self-evaluation questions, publications and other scientific activities) and the bibliometric reports. All documents were delivered to the panellists for examination.

Traditional bibliometrics can be reasonably done mainly in medicine, biosciences and natural sciences when using the Web of Science database, for example. Bibliometrics, provided by CWTS/The Centre for Science and Technology Studies, University of Leiden, cover only the publications that include WoS identification in the TUHAT-RIS.

Traditional bibliometrics are seldom relevant in humanities and social sciences because the international comparable databases do not store every type of high quality research publications, such as books and monographs and scientific journals in other languages than English. The Helsinki University Library has done analysis to the RCs, if their publications were not well represented in the Web of Science databases (RCs should have at least 50 publications and internal coverage of publications more than 40%) – it meant 58 RCs. The bibliometric material for the evaluation panels was available in June 2011. The RC-specific bibliometric reports are attached at the end of each report.

The panels were provided with the evaluation material and all other necessary background information, such as the basic information about the University of Helsinki and the Finnish higher education system.

Evaluation material

1. Registration documents of the RCs for the background information
2. Self evaluation material – answers to the evaluation questions
3. Publications and other scientific activities based on the TUHAT RIS:
 - 3.1. statistics of publications
 - 3.2. list of publications
 - 3.3. statistics of other scientific activities
 - 3.4. list of other scientific activities
4. Bibliometrics and comparable analyses:
 - 4.1. Analyses of publications based on the verification of TUHAT-RIS publications with the Web of Science publications (CWTS/University of Leiden)
 - 4.2. Publication statistics analysed by the Helsinki University Library - mainly for humanities and social sciences
5. University level survey on doctoral training (August 2011)
6. University level analysis on publications 2005–2010 (August 2011) provided by CWTS/University of Leiden

Background material

University of Helsinki

- [Basic information about the University of the Helsinki](#)
- [The structure of doctoral training at the University of Helsinki](#)
- Previous evaluations of research at the University of Helsinki – links to the reports: [1998](#) and [2005](#)

The Finnish Universities/Research Institutes

- [Finnish University system](#)
- [Evaluation of the Finnish National Innovation System](#)
- [The State and Quality of Scientific Research in Finland. Publication of the Academy of Finland 9/09.](#)

The evaluation panels were provided also with other relevant material on request before the meetings in Helsinki.

1.6 Evaluation questions and material

The participating RCs answered the following evaluation questions which are presented according to the evaluation form. In addition, TUHAT RIS was used to provide the **additional material** as explained. For giving the feedback to the RCs, the panellists received the evaluation feedback form constructed in line with the evaluation questions:

1. Focus and quality of the RC's research

- Description of
 - the RC's research focus.
 - the quality of the RC's research (incl. key research questions and results)
 - the scientific significance of the RC's research in the research field(s)
- Identification of the ways to strengthen the focus and improve the quality of the RC's research

The additional material: TUHAT compilation of the RC's publications, analysis of the RC's publications data (provided by University of Leiden and the Helsinki University Library)

A written feedback from the aspects of: scientific quality, scientific significance, societal impact, innovativeness

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

2. Practises and quality of doctoral training

- Organising of the doctoral training in the RC. Description of the RC's principles for:
 - recruitment and selection of doctoral candidates
 - supervision of doctoral candidates
 - collaboration with faculties, departments/institutes, and potential graduate schools/doctoral programmes
 - good practises and quality assurance in doctoral training
 - assuring of good career perspectives for the doctoral candidates/fresh doctorates
- Identification of the RC's strengths and challenges related to the practises and quality of doctoral training, and the actions planned for their development.

The additional material: TUHAT compilation of the RC's other scientific activities/supervision of doctoral dissertations

A written feedback from the aspects of: processes and good practices related to leadership and management

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

3. The societal impact of research and doctoral training

- Description on how the RC interacts with and contributes to the society (collaboration with public, private and/or 3rd sector).
- Identification of the ways to strengthen the societal impact of the RC's research and doctoral training.

The additional material: TUHAT compilation of the RC's other scientific activities.

A written feedback from the aspects of: societal impact, national and international collaboration, innovativeness

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

4. International and national (incl. intersectoral) research collaboration and researcher mobility

- Description of
 - the RC's research collaborations and joint doctoral training activities
 - how the RC has promoted researcher mobility
- Identification of the RC's strengths and challenges related to research collaboration and researcher mobility, and the actions planned for their development.

A written feedback from the aspects of: scientific quality, national and international collaboration

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

5. Operational conditions

- Description of the operational conditions in the RC's research environment (e.g. research infrastructure, balance between research and teaching duties).
- Identification of the RC's strengths and challenges related to operational conditions, and the actions planned for their development.

A written feedback from the aspects of: processes and good practices related to leadership and management

- Strengths
- Areas of development
- Other remarks
- Recommendations

6. Leadership and management in the researcher community

- Description of
 - the execution and processes of leadership in the RC
 - how the management-related responsibilities and roles are distributed in the RC
 - how the leadership- and management-related processes support
 - high quality research
 - collaboration between principal investigators and other researchers in the RC
 - the RC's research focus
 - strengthening of the RC's know-how
- Identification of the RC's strengths and challenges related to leadership and management, and the actions planned for developing the processes

7. External competitive funding of the RC

- The RCs were asked to provide information of such external competitive funding, where:
 - the funding decisions have been made during 1.1.2005-31.12.2010, and
 - the administrator of the funding is/has been the University of Helsinki
- On the e-form the RCs were asked to provide:
 - 1) The relevant funding source(s) from a given list (Academy of Finland/Research Council, TEKES/The Finnish Funding Agency for Technology and Innovation, EU, ERC, foundations, other national funding organisations, other international funding organisations), and
 - 2) The total sum of funding which the organisation in question had decided to allocate to the RCs members during 1.1.2005-31.12.2010.

Competitive funding reported in the text is also to be considered when evaluating this point.

A written feedback from the aspects of: scientific quality, scientific significance, societal impact, innovativeness, future significance

- Strengths
- Areas of development
- Other remarks
- Recommendations

8. The RC's strategic action plan for 2011-2013

- RC's description of their future perspectives in relation to research and doctoral training.

A written feedback from the aspects of: scientific quality, scientific significance, societal impact, processes and good practices related to leadership and management, national and international collaboration, innovativeness, future significance

- Strengths
- Areas of development

- Other remarks
- Recommendations

9. Evaluation of the category of the RC in the context of entity of the evaluation material (1-8)

The RC's fitness to the chosen participation category

A written feedback evaluating the RC's fitness to the chosen participation category

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

10. Short description of how the RC members contributed the compilation of the stage 2 material

Comments on the compilation of evaluation material

11. How the UH's focus areas are presented in the RC's research?

Comments if applicable

12. RC-specific main recommendations based on the previous questions 1-11

13. RC-specific conclusions

1.7 Evaluation criteria

The panellists were expected to give evaluative and analytical feedback to each evaluation question according to their aspects in order to describe and justify the quality of the submitted material. In addition, the evaluation feedback was asked to be pointed out the level of the performance according to the following classifications:

- outstanding (5)
- excellent (4)
- very good (3)
- good (2)
- sufficient (1)

Evaluation according to the criteria was to be made with thorough consideration of the entire evaluation material of the RC in question. Finally, in questions 1-4 and 9, the panellists were expected to classify their written feedback into one of the provided levels (the levels included respective descriptions, 'criteria'). Some panels used decimals in marks. The descriptive level was interpreted according to the integers and not rounding up the decimals by the editors.

Description of criteria levels

Question 1 – FOCUS AND QUALITY OF THE RC'S RESEARCH

Classification: Criteria (level of procedures and results)

Outstanding quality of procedures and results (5)

Outstandingly strong research, also from international perspective. Attracts great international interest with a wide impact, including publications in leading journals and/or monographs published by leading international publishing houses. The research has world leading qualities. The research focus, key research questions scientific significance, societal impact and innovativeness are of outstanding quality.

In cases where the research is of a national character and, in the judgement of the evaluators, should remain so, the concepts of "international attention" or "international impact" etc. in the grading criteria above may be replaced by "international comparability".

Operations and procedures are of outstanding quality, transparent and shared in the community. The improvement of research and other efforts are documented and operations and practices are in alignment with the documentation. The ambition to develop the community together is of outstanding quality.

Excellent quality of procedures and results (4)

Research of excellent quality. Typically published with great impact, also internationally. Without doubt, the research has a leading position in its field in Finland.

Operations and procedures are of excellent quality, transparent and shared in the community. The improvement of research and other efforts are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of excellent quality.

Very good quality of procedures and results (3)

The research is of such very good quality that it attracts wide national and international attention.

Operations and procedures are of very good quality, transparent and shared in the community. The improvement of research and other efforts are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of very good quality.

Good quality of procedures and results (2)

Good research attracting mainly national attention but possessing international potential, extraordinarily high relevance may motivate good research.

Operations and procedures are of good quality, shared occasionally in the community. The improvement of research and other efforts are occasionally documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of good quality.

Sufficient quality of procedures and results (1)

In some cases the research is insufficient and reports do not gain wide circulation or do not have national or international attention. Research activities should be revised.

Operations and procedures are of sufficient quality, shared occasionally in the community. The improvement of research and other efforts are occasionally documented and operations and practices are to some extent in alignment with the documentation. The ambition to develop the community together is of sufficient quality.

Question 2 – DOCTORAL TRAINING

Question 3 – SOCIETAL IMPACT

Question 4 – COLLABORATION

Classification: Criteria (level of procedures and results)

Outstanding quality of procedures and results (5)

Procedures are of outstanding quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are documented and operations and practices are in alignment with the documentation. The ambition to develop the community together is of outstanding quality. The procedures and results are regularly evaluated and the feedback has an effect on the planning.

Excellent quality of procedures and results (4)

Procedures are of excellent quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of excellent quality. The procedures and outcomes are evaluated and the feedback has an effect on the planning.

Very good quality of procedures and results (3)

Procedures are of very good quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and

management are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of very good quality.

Good quality of procedures and results (2)

Procedures are of good quality, shared occasionally in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of good quality.

Sufficient quality of procedures and results (1)

Procedures are of sufficient quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are occasionally documented and operations and practices are to some extent in alignment with the documentation. The ambition to develop the community together is of sufficient quality.

Question 9 – CATEGORY

Participation category – fitness for the category chosen

The choice and justification for the chosen category below should be reflected in the RC's responses to the evaluation questions 1–8.

1. *The research of the participating community represents the international cutting edge in its field.*
2. *The research of the participating community is of high quality, but the community in its present composition has yet to achieve strong international recognition or a clear break-through.*
3. *The research of the participating community is distinct from mainstream research, and the special features of the research tradition in the field must be considered in the evaluation.* The research is of high quality and has great significance and impact in its field. However, the generally used research evaluation methods do not necessarily shed sufficient light on the merits of the research.
4. *The research of the participating community represents an innovative opening.* A new opening can be an innovative combination of research fields, or it can be proven to have a special social, national or international demand or other significance. Even if the researcher community in its present composition has yet to obtain proof of international success, its members can produce convincing evidence of the high level of their previous research.
5. *The research of the participating community has a highly significant societal impact.* The participating researcher community is able to justify the high social significance of its research. The research may relate to national legislation, media visibility or participation in social debate, or other activities promoting social development and human welfare. In addition to having societal impact, the research must be of a high standard.

An example of outstanding fitness for category choice (5) ⁵

The RC's representation and argumentation for the chosen category were convincing. The RC recognized its real capacity and apparent outcomes in a wider context to the research communities. The specific character of the RC was well-recognized and well stated in the responses. The RC fitted optimally for the category.

- Outstanding (5)
- Excellent (4)
- Very good (3)
- Good (2)
- Sufficient (1)

The above-mentioned definition of outstanding was only an example in order to assist the panellists in the positioning of the classification. There was no exact definition for the category fitness.

⁵ The panels discussed the category fitness and made the final conclusions of the interpretation of it.

1.8 Timetable of the evaluation

The main timetable of the evaluation:

- | | |
|--|-----------------------|
| 1. Registration | November 2010 |
| 2. Submission of self-evaluation materials | January–February 2011 |
| 3. External peer review | May–September 2011 |
| 4. Published reports | March–April 2012 |
| - University level public report | |
| - RC specific reports | |

The entire evaluation was implemented during the university's strategy period 2010–2012. The preliminary results were available for the planning of the following strategy period in late autumn 2011. The evaluation reports will be published in March/April 2012. More detailed time schedule is published in the University report.

1.9 Evaluation feedback – consensus of the entire panel

The panellists evaluated all the RC-specific material before the meetings in Helsinki and mailed the draft reports to the evaluation office. The latest interim versions were on-line available to all the panellists on the Wiki-sites. In September 2011, in Helsinki the panels discussed the material, revised the first draft reports and decided the final numeric evaluation. After the meetings in Helsinki, the panels continued working and finalised the reports before the end of November 2011. The final RC-specific reports are the consensus of the entire panel.

The evaluation reports were written by the panels independently. During the editing process, the evaluation office requested some clarifications from the panels when necessary. The tone and style in the reports were not harmonized in the editing process. All the reports follow the original texts written by the panels as far as it was possible.

The original evaluation material of the RCs, provided for the panellists is attached at the end of the report. It is essential to notice that the exported lists of publications and other scientific activities depend how the data was stored in the TUHAT-RIS by the RCs.

2 Evaluation feedback

2.1 Focus and quality of the RC's research

- *Description of*
 - *the RC's research focus*
 - *the quality of the RC's research (incl. key research questions and results)*
 - *the scientific significance of the RC's research in the research field(s)*
 - *Identification of the ways to strengthen the focus and improve the quality of the RC's research*
- ASPECTS: Scientific quality, scientific significance, societal impact, innovativeness*

The focus of the ATM RC has been described as follows:

1. formation and growth mechanisms of atmospheric aerosols, aerosol dynamics and air ion and cluster dynamics
2. the effect of secondary biogenic aerosols on global aerosol load
3. aerosol-cloud-climate interaction
4. the relationships between the atmosphere and different ecosystems, particularly the boreal forest
5. The ATM group consists of 19 professors, 47 senior or post-doctoral researchers and 54 PhD students or technical staff.

The publication record shows high scientific impact with 15 Nature and Science papers during 2005-2010, and ca. 550 peer reviewed articles in other high quality journals (MNJS 1.37, THCP 1.59). The leading researchers are high in their fields of the ISI rankings (Kulmala 3/Geosciences; Vesala 50/Ecology and Environment). According to the bibliometric study prepared for this evaluation the citation indices are also high: MCS 7.23 and MNCS 1.56, i.e. well above the average in the field.

The recent results are specified in the material in the following highlights:

1. Development of continuous comprehensive research stations and the use of continuous data in climatological studies, participation in the ESFRI process at national and international levels.
2. Air quality – climate interactions. Initiation of scientific discussion on how cleaner air will cause hotter climate.
3. Towards quantitative understanding of new particle formation: Improvement of the atmospheric particle detection efficiency from 3nm to 1.2 nm, and analyses of the composition of small ions and neutral molecules and clusters.
4. From nm-scale to global scale: Nucleation parameterizations based on quantum chemistry and cluster models as well as atmospheric observation and laboratory experiments have been utilized in global climate models and CTMs to improve the understanding of the role of aerosols in global climate change.
5. The conceptual understanding of forest ecosystem – atmosphere interactions and processes in the ecosystem has been utilized e.g. in studies connecting photosynthesis and aerosol production. The plant biophysical approach links the transport in roots and tree stems to leaf gas exchange and the detailed influence of light and temperature on the physiology of photosynthesis.
6. Climate change influences terrestrial carbon balance: The effect of nitrogen deposition on forest net carbon sequestration is positive in all currently available data sets. The northern terrestrial ecosystems may loose carbon dioxide in strong response to autumn warming, offsetting the increased carbon dioxide uptake during spring, when the growing season tends to start earlier due to warming.

Many of the members of ATM are also active in editorial and referee work in top journals of the relevant fields as well as opponents and examiners of theses. They have received various scientific awards and two ERC advanced grants (Kulmala, Zilitinkievich) and one ERC starting grant (Vehkamäki).

Overall, ATM is internationally recognized, particularly for their specific Nordic oriented climate research. Methodologically they apparently have a leading position within the research community.

The long-term time series provide unique opportunities for further analyses. New innovative combinations of different datasets might open new avenues.

Numeric evaluation: 5 (Outstanding)

2.2 Practises and quality of doctoral training

- *Organising of the doctoral training in the RC. Description of the RC's principles for:*
 - *recruitment and selection of doctoral candidates*
 - *supervision of doctoral candidates*
 - *collaboration with faculties, departments/institutes, and potential graduate schools/doctoral programmes*
 - *good practises and quality assurance in doctoral training*
 - *assuring of good career perspectives for the doctoral candidates/fresh doctorates*
- *Identification of the RC's strengths and challenges related to the practises and quality of doctoral training, and the actions planned for their development.*
- *Additional material: TUHAT compilation of the RC's other scientific activities/supervision of doctoral dissertations*

ASPECTS: *Processes and good practices related to leadership and management*

ATM educated 46 doctors in 2005-2010. It coordinates a multi-site national doctoral programme "Atmospheric Composition and Climate Change: From Molecular Processes to Global Observations and Models (ACCC)", and all the doctoral training within the ATM is done in the context of that programme. The ATM currently has 76 doctoral students. The core of the doctoral programme includes four universities, four research institutes, and five private enterprises.

International collaboration is active in doctoral training e.g. within the Marie Curie Initial Training Network CLOUDITN, Nordic graduate school CBACCI, Nordic centres of excellence CRAICC and DEFROST, the iLEAPS IPO, EUSAAR, and ACCENT.

ACCC organizes an open, international doctoral student selection biannually. Generally, the applications are ranked according to the following guidelines:

- suitability of master's degree studies
- grades in master's degree studies
- number and quality of publications
- other scientific and technological merits
- initial research plan
- supervisors' statements

The top applicants are always interviewed. Special attention is paid to equality issues in the student selection. Currently there is a good balance between genders (47% of all students are female).

In practice the doctoral training is organized the following way:

- providing core and transferable skills by a selection of courses, many of them given jointly with other universities and research institutes
- a well-specified research project
- 2-3 supervisors, including at least one senior scientist who is internationally recognized.
- guidance groups
- participation in workshops and conferences
- mobility (national, international, cross-sector)

ATM organizes annually joint summer and winter schools, field courses (totalling 4-6). Ad hoc courses, workshops and conferences (incl. annual workshop of the ACCC doctoral programme and annual workshop for teachers and supervisors) as well as E-learning courses (2-5, usually organized jointly).

In the beginning of PhD studies, each student prepares a study and research plan, identifying the skills to be developed (the gap between the current situation and the desired outcome) and educational

activities, including courses and training on transferable skills, needed to meet the goals in the specific time window (usually 4 years). The personalized projects often include inter-sectoral visits and/or secondments to another institution in Finland or abroad. The study plans are designed by recognizing the whole research career.

ATM follows the Standards and Guidelines for Quality Assurance in the European Higher Education Area.

ATM itself has recognized one future challenge in doctoral training: a rapidly growing research community in the ATM's research areas in Finland creates challenges in the general coordination of doctoral training.

Overall, the doctoral training is very well organized and continuously and systematically evaluated in ATM. This is reflected in the number of PhDs produced as well as in the good employment of PhDs after the studies. The latter of course is also supported by the demand for their specific skills and knowledge in the labour market. The attraction of the PhD students in the labour market is also based on their tight integration in running research projects.

The procedures developed for doctoral training in ATM provide a good benchmark which could be used more widely in the whole university.

Numeric evaluation: 5 (Outstanding)

2.3 The societal impact of research and doctoral training

- *Description on how the RC interacts with and contributes to the society (collaboration with public, private and/or 3rd sector).*
- *Identification of the ways to strengthen the societal impact of the RC's research and doctoral training.*
- *Additional material: TUHAT compilation of the RC's other scientific activities.*

ASPECTS: Societal impact, national and international collaboration, innovativeness

In addition to international peer-reviewed journals, scientific results of ATM are published in various reports, newsletters, conference publications and short popular scientific articles.

ATM research contributes directly to current debate on climate change and air quality issues by delivering state-of the art data for science policy and policy making processes. ATM contributes its science findings to international assessments, e.g. IPCC assessment reports as well as to international climate negotiations (COP/CMP), the Vienna Convention on the Protection of the Ozone Layer and the Convention of Long-range transport of Air Pollutants. Several ATM scientists are members of expert panels e.g. of funding agencies, and of working groups of ministries.

The wider public is informed via interviews and articles in popular science magazines, newspapers as well as in the television and radio. ATM is a founding member in several platforms for outreach, such as Hiukkastieto (www.hiukkastieto.fi/) for aerosol information, Hiilipuu (www.hiilipuu.fi) and Ympäristötiedon foorumi (www.ymparistotiedonfoorumi.fi).

Members of ATM work also in co-operation with elementary and high schools. This was realized e.g. in the Nordic Climate Day 2010 activities with expert visits in 16 elementary schools, and by participating in organizing the Millennium Youth Camp in 2010.

There is co-operation with private sector. ATM co-operates with the CLEEN Ltd and is a member of "Business from the innovation pipeline – commercialization of cleantech innovations"-project, which aims at commercialized know-how, new enterprises and jobs.

ATM is planning to further strengthen its role in outreach platforms and on constructing European environmental research infrastructures with open data access and visualization of data. This is highly recommendable.

Numeric evaluation 5 (Outstanding)

2.4 International and national (incl. intersectoral) research collaboration and researcher mobility

- *Description of*
 - *the RC's research collaborations and joint doctoral training activities*
 - *how the RC has promoted researcher mobility*
- *Identification of the RC's strengths and challenges related to research collaboration and researcher mobility, and the actions planned for their development.*

ASPECTS: Scientific quality, national and international collaboration

ATM has active collaboration with ca 80 different research laboratories and they have participated in over 40 EU projects.

Nationally ATM is a core in a CoE, coordinates a national graduate school, and operates SMEAR stations. The infrastructure project ICOS-Finland (Integrated Carbon Observation System) will launch the operation phase in 2012. ATM hosts several international visiting scientists, e.g. two FiDiPros.

ATM is a key partner in many Nordic research initiatives, e.g. the Nordic Top Research Initiative for climate, energy and environment, and Nordic CoEs. ATM coordinates the Nordic graduate school CBACCI and master program ABS. The planning of SMEAR Estonia started in 2009.

ATM is working closely with European Research Area initiatives and is active in developing ESFRI infrastructures, such as ICOS, planning of European aerosol and atmospheric chemistry infrastructure (ACTRIS I3), and enhancing collaboration between European environmental RIs.

ATM is a member of Marie Curie CLOUD-ITN (2008-12), and was a member of Marie Curie-iLEAPS (2004-08). It is a partner of a European network of excellence, ACCENT – Atmospheric Composition Change, with various mobility and training schemes.

ATM is active also in the global change research community, e.g. hosting the International Project Office of iLEAPS, Integrated Land Ecosystem – Atmosphere Processes Study.

From the beginning of 2010, Kulmala has been a co-chair of the iLEAPS. ATM is also participating on the IPCC AR5 processes.

Numeric evaluation: 5 (Outstanding)

2.5 Operational conditions

- *Description of the operational conditions in the RC's research environment (e.g. research infrastructure, balance between research and teaching duties).*
- *Identification of the RC's strengths and challenges related to operational conditions, and the actions planned for their development.*

ASPECTS: Processes and good practices related to leadership and management

The backbone of the ATM research infrastructure is the three SMEAR (Station for Measuring Forest Ecosystem- Atmosphere Relations) stations. The SMEAR II station is a flagship measurement station, currently accepted in the ICOS network as an atmospheric and full ecosystem station.

ATM has been very successful in developing the research infrastructure. The physical infrastructure is well established and at present the challenges are related to technical staff and continuity because most the ATM members are funded from external sources. Naturally the instrumentation has to be continuously updated making use of the new technologies.

2.6 Leadership and management in the researcher community

- *Description of*
 - *the execution and processes of leadership in the RC*

- *how the management-related responsibilities and roles are distributed in the RC*
- *how the leadership- and management-related processes support*
 - *high quality research*
 - *collaboration between principal investigators and other researchers in the RC*
 - *the RC's research focus*
 - *strengthening of the RC's know-how*
- *Identification of the RC's strengths and challenges related to leadership and management, and the actions planned for developing the processes*

ASPECTS: *Processes and good practices related to leadership and management*

ATM is formed by researchers from two faculties and three departments at UH. The core of the unit is the Finnish Center of Excellence in Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change (FCoE), led by Acad. Prof. Markku Kulmala who is also the chair of the FCoE Board. The practical issues within ATM are coordinated by a research coordinator and teaching coordination is done by a university lecturer. This structure indicates a very professional organization and is reflected in the excellent output.

The scientific work is divided into smaller thematic sub-groups, which all utilize the common strategic plan. All senior scientists and sub-group leaders participate in strategic planning within ATM. A special empowerment project for planning group members to develop leadership skills and practices was organized between 2008–2009.

The quality of scientific leadership can be seen in outstanding results (Nature/Science papers, ERC grants etc.). Coordination of research and education are closely linked together and all ATM members are involved in both.

Leadership and management of a big multidisciplinary research community as such is a big challenge. The self-evaluation has identified several challenges related to that, but has also realistic plans how to tackle them. This RC is also very successful in terms of gender balance.

2.7 External competitive funding of the RC

- *The RCs were asked to provide information of such external competitive funding, where:*
 - *the funding decisions have been made during 1.1.2005–31.12.2010, and*
 - *the administrator of the funding is/has been the University of Helsinki*
- *On the e-form the RCs were asked to provide:*
 - 1) *The relevant funding source(s) from a given list (Academy of Finland/Research Council, TEKES/The Finnish Funding Agency for Technology and Innovation, EU, ERC, foundations, other national funding organisations, other international funding organizations), and*
 - 2) *The total sum of funding which the organisation in question had decided to allocate to the RCs members during 1.1.2005–31.12.2010.*

Competitive funding reported in the text is also to be considered when evaluating this point.

ASPECTS: *Scientific quality, scientific significance, societal impact, innovativeness and future significance*

ATM has been extremely successful in obtaining external funding. During the evaluation period 2005–2010 the total amount of external funding was around 40 mill €. The sources include all relevant national funding organizations, EU, ERC and also the private sector.

The challenge is to maintain the good level of external funding in the present economic situation in Europe. However, ATM is a very well placed and active player in the national, European and global research policy arenas.

2.8 The RC's strategic action plan for 2011–2013

• *RC's description of their future perspectives in relation to research and doctoral training.*

ASPECTS: Scientific quality, scientific significance, societal Impact, processes and good practices related to leadership and management, national and international collaboration, innovativeness, future significance

ATM has very clear objectives and implementation plans how to develop the research infrastructure and education and where to focus in research. Based on the evidence from the evaluation period the plans are realistic.

The challenge in the big strong research community like ATM, is how to maintain and enhance innovative thinking, to keep a clear focus and at the same time encourage people to think out of the box.

2.9 Evaluation of the category of the RC in the context of entity of the evaluation material (1-8)

The RC's fitness to the chosen participation category.

ATM has chosen the participation category 1. *The research of the participating community represents the international cutting edge in its field.*

The material provided to us proves that the choice is very well justified. If one could choose more categories, also the category 5 would be applicable.

Numeric evaluation: 5 (Outstanding)

2.10 Short description of how the RC members contributed the compilation of the stage 2 material

The whole ATM was involved in the compilation of the material, and the process has as such been also an education process.

2.11 How the UH's focus areas are presented in the RC's research

Focus area 3: The changing environment – clean water

ATM is instrumental to the UH focus area 'The changing environment – clean water'.

2.12 RC-specific main recommendations

The long-term time series provide unique opportunities for further analyses. New innovative combinations of different datasets might open new avenues.

ATM is planning to further strengthen its role in outreach platforms and on constructing European environmental research infrastructures with open data access and visualization of data. This is highly recommendable.

It would be worth devoting some time for foresight thinking on the potential research themes in the longer time horizon like 20 years.

2.13 RC-specific conclusions

ATM is internationally highly recognized, particularly for their specific Nordic oriented climate research. Methodologically they have a leading position within the research community. The scientific quality of research in ATM is outstanding: 15 Nature and Science papers were published by this RC during 2005-2010, and ca. 550 peer reviewed articles in other high quality journals. The leading researchers are high in their fields of the ISI rankings (Kulmala 3/Geosciences; Vesala 50/Ecology and Environment). In addition to international peer-reviewed journals, scientific results of ATM are published in various reports, newsletters, conference publications and short popular scientific articles. The wider public is informed via interviews and articles in popular science magazines and in the public media. ATM is a founding member in several platforms for outreach. Members of ATM work also in co-operation with elementary and high schools.

Many of the members of the ATM RC are active in editorial and referee work in top journals of the relevant fields as well as opponents and examiners of theses. They have received various scientific awards and two ERC advanced grants and one ERC starting grant.

ATM research contributes directly to current debate on climate change and air quality issues by delivering state-of the art data for science policy and policy making processes. ATM contributes its science findings to international assessments, e.g. IPCC assessment reports as well as to international climate negotiations (COP/CMP). Several ATM scientists are members of expert panels e.g. of funding agencies, and of working groups of ministries.

Doctoral training is very well organized and continuously and systematically evaluated in the ATM. This is reflected in the number of PhDs produced as well as in the good employment of PhDs after the studies. The latter of course is also supported by the demand for their specific skills and knowledge in the labour market. The doctoral training procedures of ATM could provide a benchmark for doctoral training in the whole university.

ATM has active collaboration with ca 80 different research laboratories and they have participated in over 40 EU projects.

ATM is a core of a national CoE and a key partner in Nordic CoEs, a partner of European network of excellence, ACCENT. It coordinates a national and a Nordic graduate school, a Nordic master programme, and operates the Finnish SMEAR stations. The planning of SMEAR Estonia started in 2009. The infrastructure project ICOS-Finland (Integrated Carbon Observation System) will launch the operation phase in 2012. ABS. ATM is working closely with European Research Area initiatives and is active in ESFRI infrastructures, such as ICOS and in planning of European aerosol and atmospheric chemistry infrastructure (ACTRIS I3). They have successfully exploited Marie Curie instruments. ATM is active also in the global change research community, e.g. hosting the International Project Office of iLEAPS. From the beginning of 2010, Kulmala has been a co-chair of iLEAPS.

There is also co-operation with private sector. ATM co-operates with the CLEEN Ltd and is a member of "Business from the innovation pipeline – commercialization of cleantech innovations" -project, which aims at commercialized know-how, new enterprises and jobs.

ATM has been extremely successful in obtaining external funding (in 2005-2010 altogether 40 mill €). The sources include all relevant funding organizations.

ATM has very clear objectives and implementation plans how to develop the research infrastructure and education and where to focus in research. Based on the evidence from the evaluation period the plans are realistic.

The challenge in the big strong well established research community like ATM, is how to maintain and enhance innovative thinking, to keep a clear focus and at the same time encourage people to think out of the box.

2.14 Preliminary findings in the Panel-specific feedback

ATM could provide a benchmark for doctoral training in the whole university.

ATM is an excellent example of a successful multi- and interdisciplinary research community which has developed and expanded during a long period of time. The lessons learnt from this process should be analyzed and utilized when the university is developing the implementation of its strategy.

2.15 Preliminary findings in the University-level evaluation

ATM could provide a benchmark for doctoral training in the whole university.

ATM is an excellent example of a successful multi- and interdisciplinary research community which has developed and expanded during a long period of time. The lessons learnt from this process should be analyzed and utilized when the university is developing the implementation of its strategy.

3 Appendices

- A. Original evaluation material
 - a. Registration material – Stage 1
 - b. Answers to evaluation questions – Stage 2
 - c. List of publications
 - d. List of other scientific activities
- B. Bibliometric analyses
 - a. Analysis provided by CWTS/University of Leiden
 - b. Analysis provided by Helsinki University Library (66 RCs)



International evaluation of research and doctoral training
at the University of Helsinki 2005-2010

RC-SPECIFIC MATERIAL FOR THE PEER REVIEW

NAME OF THE RESEARCHER COMMUNITY:

Center of Excellence in Physics, Chemistry, Biology and Meteorology of Atmospheric
Composition and Climate Change (ATM)

LEADER OF THE RESEARCHER COMMUNITY:

Professor Markku Kulmala, Department of Physics, Faculty of Science

RC-SPECIFIC MATERIAL FOR THE PEER REVIEW:

- Material submitted by the RC at stages 1 and 2 of the evaluation
 - STAGE 1 material: RC's registration form (incl. list of RC participants in an excel table)
 - STAGE 2 material: RC's answers to evaluation questions
- TUHAT compilations of the RC members' publications 1.1.2005-31.12.2010
- TUHAT compilations of the RC members' other scientific activities 1.1.2005-31.12.2010
- Web of Science(WoS)-based bibliometrics of the RC's publications data 1.1.2005-31.12.2010 (analysis carried out by CWTS, Leiden University)

NB! Since Web of Science(WoS)-based bibliometrics does not provide representative results for most RCs representing humanities, social sciences and computer sciences, the publications of these RCs will be analyzed by the UH Library (results available by the end of June, 2011)



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 1 MATERIAL (registration form)

1 RESPONSIBLE PERSON

Name: Kulmala, Markku

E-mail:

Phone: +358 40 5962311

Affiliation: Professor

Street address: Gustaf Hållströminkatu 2a

2 DESCRIPTION OF THE PARTICIPATING RESEARCHER COMMUNITY (RC)

Name of the participating RC (max. 30 characters): Center of Excellence in Physics, Chemistry, Biology and Meteorology of Atmosphere

Acronym for the participating RC (max. 10 characters): ATM

Description of the operational basis in 2005-2010 (eg. research collaboration, joint doctoral training activities) on which the RC was formed (MAX. 2200 characters with spaces): ATM is formed on the basis of the long-lasting and successful collaboration between aerosol physicists and forest ecologists at the University of Helsinki, initiated already in 1980's. The research group created the SMEAR stations (Stations for Measuring Forest Ecosystem - Atmosphere Relations), recognized as world leading supersites in atmospheric research. The group was later replenished with atmospheric chemistry and dynamic meteorology. Besides national centre of excellence, ATM is also collaborating in researcher training in the form of a joint Nordic Master program (Atmosphere-Biosphere Studies), a post-doctoral study program CBACCI (Carbon-Biosphere-Atmosphere-Clouds-Climate Interactions) and a Graduate School (The Atmospheric Composition and Climate Change: From Molecular Processes to Global Observations and Models). We are combining the strengths of three departments in two faculties, namely Department of Physics and Department of Chemistry in the Faculty of Natural Sciences, and Department of Forest Sciences in the Faculty of Agriculture and Forestry.

Our main objective is to contribute to the reduction of scientific uncertainties concerning global climate change questions, particularly those related to aerosols and clouds. We aim at a deep understanding on the dynamics of aerosol particles and ion and neutral clusters in the lower atmosphere, with the emphasis in their biogenic formation mechanisms and linkages to biosphere-atmosphere interaction processes, biogeochemical cycles and trace gases. Our research involves detailed laboratory studies, multi-scale field studies, satellite-based remote-sensing and numerical and process modelling ranging from the molecular ab initio level to the global scale Earth system models. The use of the results in the context of global scale modelling, and the development and utilisation of the newest measurement techniques are emphasized. The cores of our activities are a) continuous measurements and database of atmospheric and ecological mass fluxes and aerosol precursors and CO₂/aerosol/trace gas interactions in SMEAR field stations and b) focused experiments and modelling to understand the observed patterns.



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 1 MATERIAL (registration form)

3 SCIENTIFIC FIELDS OF THE RC

Main scientific field of the RC's research: natural sciences

RC's scientific subfield 1: Physics, Multidisciplinary

RC's scientific subfield 2: Geosciences, Multidisciplinary

RC's scientific subfield 3: Forestry

RC's scientific subfield 4: Chemistry, Analytical

Other, if not in the list: Environment and ecology

Geosciences, atmospheric sciences

4 RC'S PARTICIPATION CATEGORY

Participation category: 1. Research of the participating community represents the international cutting edge in its field

Justification for the selected participation category (MAX. 2200 characters with spaces): The 4th assessment report of IPCC has identified aerosols, clouds and precipitation as one of the largest uncertainties in our current understanding of the climate system (IPCC, 2007), and the work done in ATM aims at filling this knowledge gap. Finland is a world leader in the field of atmospheric sciences and atmosphere-biosphere research, mainly due to the long-standing collaborative work done by physicists and forest scientists at the University of Helsinki. This fruitful collaboration has been awarded with both national, Nordic and European Center of Excellence status, ERC fundings (two Advanced and a Starting research grant) and two FiDiPro positions. ATM is actively participating in the work of IPCC (Intergovernmental Panel for Climate Change) and IGBP (the International Geosphere-Biosphere Programme) by co-chairing and hosting iLEAPS (Integrated Land Ecosystem – Atmosphere Processes Study) international project office.

Our publication record shows high scientific impact with 15 Nature and Science papers during 2005-2010 (10% of all Nature/Science articles by Finnish researchers), in addition to the ca. 550 peer reviewed articles in other high quality journals. The leading researchers are high in their fields the ISI rankings (Kulmala 3/Geosciences; Vesala 50/Ecology and Environment).

Our focus has been in following topics:

1. formation and growth mechanisms of atmospheric aerosols, aerosol dynamics and air ion and cluster dynamics (Berndt et al Science 2005; Kulmala et al 2007 Science; Winkler et al 2008 Science, Sipilä et al 2010 Science)
2. the effect of secondary biogenic aerosols on global aerosol load (O'Dowd et al Nature 2005; Tunved et al Science 2006; Jimenez et al Science 2009; Virtanen et al Nature 2010)
3. aerosol-cloud-climate interaction (Rosenfeld et al Science 2008)
4. the relationships between the atmosphere and different ecosystems, particularly the boreal forest (Ciais et al Nature 2005; Magnani et al Nature 2007, 2008; Piao et al Nature 2008)



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 1 MATERIAL (registration form)

5. Climate – air quality interactions (Arneth et al Science 2009)

5 DESCRIPTION OF THE RC'S RESEARCH AND DOCTORAL TRAINING

Public description of the RC's research and doctoral training (MAX. 2200 characters with spaces): The research in ATM involves several fields of science such as physics, chemistry, meteorology, biology, agricultural and forest sciences, technology, and biogeosciences. It forms a framework where observations are based on unifying theoretical framework, and are carried out with up-to-date ground-based, airborne and satellite measurement techniques (including development of new devices and instrumentation), supporting each other. Furthermore, field observations are tested, compared, and analysed against laboratory experiments, and the underlying process understanding is tightly tied to theoretical and modeling work as well as model development. The ability to up-scale the small scale processes to the regional and global level phenomena and dynamics is of great importance for the society and scientific community. Our research includes all these components and also brings them to the level of the student training.

The ATM research and education has three strong pillars: an advanced research infrastructure (SMEAR stations and laboratories), a powerful and internationally oriented researcher community (Finnish and Nordic Centres of Excellence), and an efficient training structure based on best practices collected from several universities in Nordic and Baltic countries. Our doctoral training programme aims at educating multidisciplinary experts to tackle the future challenges of climate change, air quality problems and environmental technologies.

The ATM group includes 19 professors, 47 senior or post-doctoral researchers and 54 PhD students or technical staff.

Significance of the RC's research and doctoral training for the University of Helsinki (MAX. 2200 characters with spaces): ATM is one of the world leaders in our research area, and it possesses the most modern and versatile measurement systems for measuring ecosystem-atmosphere interactions. The activity and the role of the ATM in European and global initiative has been recognized by the University of Helsinki by listing atmospheric sciences as one of the research focus areas in the strategy of the University of Helsinki. ATM is supporting and promoting the general aim of the University of Helsinki to be included in the world's 25 top universities. This is done by

- participating actively in European and Global research initiatives and development in the field of atmospheric and biogeosciences.
- being active in various European Research Area initiatives, such as building of European research infrastructures, establishing Joint Programming activities, enhancing the mobility of European researchers and promoting European Science & technology collaboration. Specifically, we are active in ESFRI infrastructures, such as building ICOS (Integrated Carbon Observation System), planning of European aerosol and atmospheric chemistry infrastructure and the Distributed Infrastructure for experimentation in ecosystem research, and enhancing overall collaboration between European environmental research infrastructures. We are also active in planning the Joint Programming Initiative



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on decadal climate predictability and developing of better climate services for end-users (JPI - Connecting Climate Knowledge for Europe, Clik'EU).

- collaborating with several industrial enterprises and the Strategic Centre for Science, Technology and Innovation in Energy and Environment, coordinated by CLEEN Ltd. Our educational programmes are working together with private enterprises, and we actively promote spin-off company development among our research fields. We anticipate a growing need for experts specialized in both the physical and biological basis of climate change phenomena, and in the potential ways to control/mitigate global warming.

Keywords: Atmosphere, biosphere, aerosols, air chemistry, meteorology, climate change, greenhouse gases, volatile organic compounds, boreal ecosystems, feedbacks, carbon cycle, nitrogen cycle, water cycle, multi-scale modeling, field measurements, health effects, tree ecophysiology, dynamic meteorology, biogeochemistry

6 QUALITY OF RC'S RESEARCH AND DOCTORAL TRAINING

Justified estimate of the quality of the RC's research and doctoral training at national and international level during 2005-2010 (MAX. 2200 characters with spaces): The importance of atmospheric aerosols to global radiation budget, cloud formation, and human health motivates our research. Ecosystems and atmosphere are tightly connected via physical, chemical, meteorological and biological processes in the atmosphere and at the atmosphere-biosphere interface. Thus, supra-disciplinary research with a high level of technological and scientific innovation is necessary.

Our publication record shows high scientific impact with 15 Nature and Science papers during 2005-2010 and ca. 550 peer reviewed articles in other high quality journals.

Our recent results are specified in the following highlights.

1. Development of continuous comprehensive research stations and the use of continuous data in climatological studies, participation in the ESFRI process at national and international levels.
2. Air quality – climate interactions. We have initiated scientific discussion on how cleaner air will cause hotter climate.
3. Towards quantitative understanding of new particle formation: We have improved the atmospheric particle detection efficiency from 3nm to 1.2 nm, and analysed the composition of small ions and neutral molecules and clusters.



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4. From nm-scale to global scale: Nucleation parameterizations based on quantum chemistry and cluster models as well as atmospheric observation and laboratory experiments have been utilized in global climate models and CTMs to improve the understanding of the role of aerosols in global climate change.
5. The conceptual understanding of forest ecosystem – atmosphere interactions and processes in the ecosystem has been utilized e.g. in studies connecting photosynthesis and aerosol production. The plant biophysical approach links the transport in roots and tree stems to leaf gas exchange and the detailed influence of light and temperature on the physiology of photosynthesis.
6. Climate change influences terrestrial carbon balance: The effect of nitrogen deposition on forest net carbon sequestration is positive in all currently available data sets. The northern terrestrial ecosystems may lose carbon dioxide in strong response to autumn warming, offsetting the increased carbon dio

Comments on how the RC's scientific productivity and doctoral training should be evaluated (MAX. 2200 characters with spaces): We are publishing our results rapidly and in high quality journals. We are also active in editorial and referee work in several top journals of our fields. The PhD students are encouraged to develop their oral and writing skills already early in their doctoral studies, and part of their regular mentoring and guidance is directly planned to aid in scientific presentation and writing. Workshops, Summer and winter schools are utilized efficiently and many of them eventually produce one or more scientific articles as an end result.

The methods for assessing scientific productivity and doctoral training:

- citation index under atmospheric sciences as a department and as individual
- our positions as a department and individuals in world lists of atmospheric science and other disciplines
- numbers, impact factors and citations of peer-reviewed articles
- numbers of Nature/Science papers, % of all Nature/Science papers which affiliate to Finnish Universities
- coordinating international research projects
- obtained external funding
- MSc and PhD degrees
- professors educated
- ERC grants
- work as journal editors and referees
- work as pre-examiner or opponent in theses
- scientific impact: awards, recognitions, memberships in expert panels

LIST OF RC MEMBERS

NAME OF THE RESEARCHER COMMUNITY:			ATM		
RC-LEADER			M. Kulmala		
CATEGORY			1		
	Last name	First name	PI-status (TUHAT, 29.11.2010)	Title of research and teaching personnel	Affiliation
1	Aalto	Juho		Doctoral candidate	Faculty of Agriculture and Forestry, Department of Forest Sciences
2	Aalto	Pasi		Senior Researcher (laboratory manager)	Faculty of Sciences, Department of Physics
3	Aaltonen	Hermann		Doctoral candidate	Faculty of Agriculture and Forestry, Department of Forest Sciences
4	Altimir	Nuria		Doctoral Candidate - Postdoctoral	Faculty of Agriculture and Forestry, Department of Forest Sciences
5	Arneth	Almut		Professor (visiting)	Faculty of Sciences, Department of Physics
6	Asmi	Ari		Doctoral candidate	Faculty of Sciences, Department of Physics
7	Asmi	Eija		Doctoral Candidate	Faculty of Sciences, Department of Physics
8	Backman	John		Doctoral candidate	Faculty of Sciences, Department of Physics
9	Bister	Marja		University Researcher	Faculty of Sciences, Department of Physics
10	Bogdan	Anatoli		University Researcher	Faculty of Sciences, Department of Physics
11	Bonn	Boris		University Researcher	Faculty of Sciences, Department of Physics
12	Boy	Michael		University Researcher	Faculty of Sciences, Department of Physics
13	Bäck	Jaana	X	University Researcher - Research Coordinator	Faculty of Agriculture and Forestry, Department of Forest Sciences
14	Chandrasekar	Venkatachalam		Professor (FIDIPRO)	Faculty of Sciences, Department of Physics
15	Dal Maso	Miikka		Doctoral Candidate - University Researcher	Faculty of Sciences, Department of Physics
16	De Leeuw	Gerrit	X	Professor	Faculty of Sciences, Department of Physics
17	Duursma	Remko		Postdoctoral	Faculty of Agriculture and Forestry, Department of Forest Sciences
18	Ehn	Mikael		Doctoral candidate	Faculty of Sciences, Department of Physics
19	Franchin	Alessandro		Doctoral candidate	Faculty of Sciences, Department of Physics
20	Gagne	Stephanie		Doctoral candidate	Faculty of Sciences, Department of Physics
21	Göke	Sabine		University Researcher	Faculty of Sciences, Department of Physics
22	Haapanala	Sami		Doctoral candidate	Faculty of Sciences, Department of Physics
23	Hari	Pertti		Professor	Faculty of Agriculture and Forestry, Department of Forest Sciences
24	Hartonen	Kari	X	University Lecturer	Faculty of Sciences, Department of Chemistry
25	Herrmann	Erik		Doctoral Candidate - Postdoctoral	Faculty of Sciences, Department of Physics
26	Hienola	Anca		Doctoral Candidate - Postdoctoral	Faculty of Sciences, Department of Physics
27	Hilasvuori	Emmi		Doctoral candidate	Faculty of Sciences, Dating laboratory
28	Hussein	Tareq		Professor	Faculty of Sciences, Department of Physics
29	Hyötyläinen	Tuulla		Professor	Faculty of Sciences, Department of Chemistry
30	Hämeri	Kaarle	X	Professor	Faculty of Sciences, Department of Physics
31	Hölttä	Teemu		Doctoral Candidate - Postdoctoral	Faculty of Agriculture and Forestry, Department of Forest Sciences
32	Julin	Jan		Doctoral candidate	Faculty of Sciences, Department of Physics
33	Junninen	Heikki		Doctoral candidate	Faculty of Sciences, Department of Physics
34	Jussila	Matti		University Instructor (laboratory technician)	Faculty of Sciences, Department of Chemistry
35	Juurola	Eija		Doctoral Candidate - Postdoctoral	Faculty of Agriculture and Forestry, Department of Forest Sciences
36	Järvi	Leena		Doctoral Candidate - Postdoctoral	Faculty of Sciences, Department of Physics
37	Kajos	Maija		Doctoral candidate	Faculty of Sciences, Department of Physics
38	Katul	Gaby		Professor (visiting)	Faculty of Sciences, Department of Physics
39	Kerminen	Veli-Matti		Professor	Faculty of Sciences, Department of Physics
40	Keronen	Petri		Doctoral candidate	Faculty of Sciences, Department of Physics
41	Kieloaho	Antti-Jussi		Doctoral candidate	Faculty of Sciences, Department of Physics
42	Kolari	Pasi		Doctoral Candidate - Postdoctoral	Faculty of Agriculture and Forestry, Department of Forest Sciences
43	Korhonen	Janne		Doctoral candidate	Faculty of Sciences, Department of Physics
44	Kulmala	Liisa		Doctoral candidate	Faculty of Agriculture and Forestry, Department of Forest Sciences
45	Kulmala	Markku	X	Professor	Faculty of Sciences, Department of Physics
46	Kurten	Theo		Doctoral Candidate - Postdoctoral	Faculty of Sciences, Department of Physics
47	Kyrö	Ella-Maria		Doctoral candidate	Faculty of Sciences, Department of Physics
48	Laakso	Lauri		University Researcher	Faculty of Sciences, Department of Physics
49	Laitinen	Totti		Doctoral candidate	Faculty of Sciences, Department of Chemistry
50	Lappalainen	Hanna		Doctoral candidate	Faculty of Sciences, Department of Physics
51	Launiainen	Samuli		Doctoral candidate	Faculty of Sciences, Department of Physics
52	Lauri	Antti		Doctoral Candidate - University Lecturer	Faculty of Sciences, Department of Physics
53	Lauros	Johanna		Doctoral candidate	Faculty of Sciences, Department of Physics
54	Lehtipalo	Katrianne		Doctoral candidate	Faculty of Sciences, Department of Physics
55	Levula	Janne		Doctoral candidate	Faculty of Sciences, Department of Physics
56	Liao	Lee		Doctoral candidate	Faculty of Sciences, Department of Physics
57	Linden	Aki		Doctoral candidate	Faculty of Agriculture and Forestry, Department of Forest Sciences
58	Loukonen	Ville		Doctoral candidate	Faculty of Sciences, Department of Physics
59	Makkonen	Risto		Doctoral candidate	Faculty of Sciences, Department of Physics
60	Mammarella	Ivan		Postdoctoral	Faculty of Sciences, Department of Physics
61	Manninen	Hanna		Doctoral candidate	Faculty of Sciences, Department of Physics
62	McGrath	Matthew		Postdoctoral	Faculty of Sciences, Department of Physics

63	Merikanto	Joonas		Postdoctoral	Faculty of Sciences, Department of Physics
64	Moissejev	Dmitri		University Researcher	Faculty of Sciences, Department of Physics
65	Molgaard	Bjarke		Doctoral candidate	Faculty of Sciences, Department of Physics
66	Mäkelä	Annikki	X	Professor	Faculty of Agriculture and Forestry, Department of Forest Sciences
67	Määttänen	Anni		University Researcher	Faculty of Sciences, Department of Physics
68	Napari	Ismo		Postdoctoral	Faculty of Sciences, Department of Physics
69	Nieminen	Tuomo		Doctoral candidate	Faculty of Sciences, Department of Physics
70	Nikinmaa	Eero	X	Senior Researcher (Academy Research Fellow) - Professor	Faculty of Agriculture and Forestry, Department of Forest Sciences
71	Nordbo	Annika		Doctoral candidate	Faculty of Sciences, Department of Physics
72	Olascoaga	Benat		Doctoral candidate	Faculty of Agriculture and Forestry, Department of Forest Sciences
73	Ortega	Ismael		Doctoral candidate	Faculty of Sciences, Department of Physics
74	Paasonen	Pauli		Doctoral candidate	Faculty of Sciences, Department of Physics
75	Parshintsev	Jevgeni		Doctoral candidate	Faculty of Sciences, Department of Chemistry
76	Patokoski	Johanna		Doctoral candidate	Faculty of Sciences, Department of Physics
77	Perämäki	Martti		University Lecturer	Faculty of Agriculture and Forestry, Department of Forest Sciences
78	Petäjä	Tuukka		Doctoral Candidate - University Researcher	Faculty of Sciences, Department of Physics
79	Pihlatie	Mari		University Researcher	Faculty of Sciences, Department of Physics
80	Pohja	Toivo		University Instructor (laboratory technician)	Faculty of Agriculture and Forestry, Department of Forest Sciences
81	Porcar-Castell	Albert		Doctoral Candidate - Postdoctoral	Faculty of Agriculture and Forestry, Department of Forest Sciences
82	Prisle	Nonne		Postdoctoral	Faculty of Sciences, Department of Physics
83	Pumpanen	Jukka	X	Senior Researcher (Academy Research Fellow)	Faculty of Agriculture and Forestry, Department of Forest Sciences
84	Raivonen	Maarit		Doctoral Candidate - Postdoctoral	Faculty of Sciences, Department of Physics
85	Rannik	Ullar		Senior Researcher (Part-time)	Faculty of Sciences, Department of Physics
86	Rasilo	Terhi		Doctoral candidate	Faculty of Agriculture and Forestry, Department of Forest Sciences
87	Reissell	Anni		University Researcher	Faculty of Sciences, Department of Physics
88	Riekkola	Marja-Liisa	X	Professor	Faculty of Sciences, Department of Chemistry
89	Riikonen	Anu		Doctoral candidate	Faculty of Agriculture and Forestry, Department of Forest Sciences
90	Riipinen	Ilona		Doctoral Candidate - Postdoctoral	Faculty of Sciences, Department of Physics
91	Rinne	Janne		Senior Researcher (Academy Research Fellow)	Faculty of Sciences, Department of Physics
92	Riuttanen	Laura		Doctoral candidate	Faculty of Sciences, Department of Physics
93	Ruiz-Jimenez	Jose		Postdoctoral	Faculty of Sciences, Department of Chemistry
94	Ruuskanen	Taina		Doctoral Candidate - Postdoctoral	Faculty of Sciences, Department of Physics
95	Ruusuvuori	Kai		Doctoral candidate	Faculty of Sciences, Department of Physics
96	Räisänen	Jouni		University Lecturer	Faculty of Sciences, Department of Physics
97	Savijärvi	Hannu	X	Professor	Faculty of Sciences, Department of Physics
98	Schiestl-Aalto	Pauliina		Doctoral candidate	Faculty of Agriculture and Forestry, Department of Forest Sciences
99	Schobesberger	Siegfried		Doctoral candidate	Faculty of Sciences, Department of Physics
100	Schultz	David	X	Professor	Faculty of Sciences, Department of Physics
101	Sevanto	Sanna		Postdoctoral	Faculty of Sciences, Department of Physics
102	Sipilä	Mikko		Doctoral candidate	Faculty of Sciences, Department of Physics
103	Sogacheva	Larisa		University Researcher	Faculty of Sciences, Department of Physics
104	Sorvari	Sanna		Postdoctoral (Project coordinator)	Faculty of Sciences, Department of Physics
105	Sundström	Anu-Maija		Doctoral candidate	Faculty of Sciences, Department of Physics
106	Suni	Tanja		Postdoctoral	Faculty of Sciences, Department of Physics
107	Taipale	Risto		Doctoral candidate	Faculty of Sciences, Department of Physics
108	Toivola	Martta		Doctoral candidate	Faculty of Sciences, Department of Physics
109	Tomasic	Marin		Postdoctoral	Faculty of Sciences, Department of Physics
110	Vakkari	Ville		Doctoral candidate	Faculty of Sciences, Department of Physics
111	Vana	Marko		Postdoctoral	Faculty of Sciences, Department of Physics
112	Vanhanen	Joonas		Doctoral candidate	Faculty of Sciences, Department of Physics
113	Vehkamäki	Hanna	X	Senior Researcher (Academy Research Fellow) - Professor	Faculty of Sciences, Department of Physics
114	Vesala	Timo	X	Professor	Faculty of Sciences, Department of Physics
115	Virkkula	Aki		University Researcher	Faculty of Sciences, Department of Physics
116	Worsnop	Douglas	X	Professor (FiDiPro)	Faculty of Sciences, Department of Physics
117	Vuollekoski	Henri		Doctoral candidate	Faculty of Sciences, Department of Physics
118	Väänänen	Riikka		Doctoral candidate	Faculty of Sciences, Department of Physics
119	Yli-Juuti	Taina		Doctoral candidate	Faculty of Sciences, Department of Physics
120	Zilitinkevich	Sergej		Professor	Faculty of Sciences, Department of Physics



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BACKGROUND INFORMATION

Name of the RC's responsible person: Kulmala, Markku

E-mail of the RC's responsible person:

Name and acronym of the participating RC: Center of Excellence in in Physics, Chemistry, Biology and Meteorology of Atmosp, ATM

The RC's research represents the following key focus area of UH: 3. Muuttuva ympäristö - puhdas vesi – The changing environment - clean water

Comments for selecting/not selecting the key focus area: ATM is investigating the Global Climate Change with interdisciplinary research tools. Our emphasis is in the biosphere-atmosphere interactions, in particular in formation and growth of atmospheric aerosols above terrestrial surfaces. We are utilizing a wide array of research tools from nano scale to global modeling, operating consistently within a research framework.

1 FOCUS AND QUALITY OF RC'S RESEARCH (MAX. 8800 CHARACTERS WITH SPACES)

- **Description of the RC's research focus, the quality of the RC's research (incl. key research questions and results) and the scientific significance of the RC's research for the research field(s).**

Understanding the global climate change and the complex, non-linear system of atmospheric new aerosol formation requires a diverse range of scientific and technological expertise in the areas of chemistry, physics, biology, and meteorology, and involves laboratory studies, ground, ship, and airborne field studies, satellite remote-sensing and numerical modelling studies ranging from the molecular ab initio level to the global scale Earth system models. Our research approach covers all those observational, experimental and theoretical aspects. Our results have given compelling evidence of the strong feedbacks between biosphere and atmosphere. Their importance has been manifested in the large number of high-impact publications from the group. During the evaluation period we have published 15 papers in Nature or Science. That is over 14% of all Nature/Science articles published by authors from University of Helsinki (altogether 105 during the period 1.1. 2005 – 31.12. 2010.). We have also received two ERC advanced grants (Kulmala, Zilitinkievich) and one starting grant (Vehkamäki).

The main focus of ATM can be divided to following main topics:

- 1) formation and growth mechanisms of atmospheric aerosols, aerosol dynamics and air ion and cluster dynamics: (Kulmala et al. Nature 2000; Kulmala, Science 2003; Berndt et al. Science 2005; Kulmala et al. 2007a Science; Winkler et al. 2008 Science; Kiendler-Scharr et al. 2009 Nature; Sipilä et al. 2010 Science; Virtanen et al. 2010 Nature)
- 2) the effect of secondary biogenic aerosols on global aerosol load: (O'Dowd et al. Nature 2002a; O'Dowd et al. Nature 2002b; O'Dowd et al. Nature 2005; Tunved et al. Science 2006; Jimenez et al., Science, 2009, Virtanen et al. Nature 2010)
- 3) aerosol-cloud-climate interaction: (Kulmala et al. Nature 1997; Charlson et al. Science 2001; Rosenfeld et al. Science 2008, Arneth et al Science 2009)
- 4) the relationships between the atmosphere and different ecosystems, particularly the boreal forest: (Hari et al. Nature 2003; Magnani et al Nature 2007, 2008; Piao et al Nature 2008).
- 5) Climate – air quality interactions (Arneth et al. Science 2009).



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During the evaluation period we have received several outstanding results, which are specified in following six highlights.

1. Further development of continuous comprehensive research stations and the use of continuous data in climatological studies: recently we have presented the concept of hierarchy of research stations based on our experience at SMEAR stations (Hari et al. 2009); the cosmic rays have been shown to have minor (ca 1%) effect on new particle formation over solar cycle (Kulmala et al. 2010).
2. Air quality – climate interactions. The conceptual paper to start the discussion how cleaner air will cause hotter climate (Arneth et al. 2009) was published. Also the results from eastern Germany (Hamed et al. 2010) show changes in nucleation rates and nucleation frequency when the pollution level has decreased between 1996 and 2006. On the other hand the growth rates are increasing.
3. Towards quantitative understanding of new particle formation. Several laboratory measurements have been performed (Sipilä et al. 2010; Kiendler-Scharr et al. 2009). We have been able to change the detection efficiency of CPCs from 3nm to 1.2 nm (Sipilä et al. 2010) and also to develop new instruments to investigate composition of small ions and probably also neutral molecules and clusters using API-ToF (Junninen et al. 2010). Also the chemical composition of recently formed particles (Smith et al. 2010) and also ageing of particles (Jimenez et al. 2009). Most recently, we have found out that biospheric particles are amorphous (Virtanen et al. 2010.)
4. From nm-scale to global scale. Nucleation parameterizations based on our quantum chemistry (Kurten et al. 2009) and cluster models as well as atmospheric observation and laboratory experiments have been utilized in global climate models and CTMs (Makkonen et al. 2009, Vesala et al 2010).
5. The scientific approach presented in the recent book (Hari & Kulmala 2008) describing the forest ecosystem – atmosphere interactions and processes in the ecosystem have been utilized e.g. in spring recovery studies connecting photosynthesis and aerosol production (Dal Maso et al 2009, Lappalainen et al 2009) and in analysis of leaf, individual and ecosystem level BVOC synthesis and emissions (Ghirardo et al 2010, Bäck et al 2010, Aaltonen et al 2011). The new physical model approach links the factors influencing long distance transport in trees to leaf gas exchange (Hölttä et al 2009, Cochard et al 2010). The detailed influence of light and temperature on the physiology of photosynthesis can be followed with leaf level measurements based on the novel Monitoring-PAM instrumentation (Porcar-Castell et al. 2008).
6. Predicting the long-term dynamics of forest productivity under climate change. Forest net carbon sequestration is overwhelmingly driven by nitrogen deposition, largely as a result of anthropogenic activities. The effect is positive over the range of nitrogen deposition covered by currently available data sets (Magnani et al 2007, 2008). The northern terrestrial ecosystems may currently lose carbon dioxide in strong response to autumn warming, offsetting the increased carbon dioxide uptake during spring, when the growing season tends to start earlier due to warming (Piao et al 2008).

ATM has an internationally leading position in the research area of formation of atmospheric aerosols and biosphere-atmosphere interactions.

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• **Ways to strengthen the focus and improve the quality of the RC's research.**

The ATM group is genuinely supradisciplinary. Our future focus is to work over boundaries from nano scale to global scale and to utilize best knowledge from different disciplines both inside and outside of ATM. Our strength is in creating a research framework where the feedbacks between biosphere and atmosphere are analyzed in a comprehensive manner and using an interdisciplinary methodology. This includes e.g. improvements in measurement techniques and instruments, data mining, new



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experiments, model development and theories in biosphere-atmosphere-climate-air quality interactions.

We are in a unique position in respect to the high temporal resolution comprehensive datasets collected over 15 years at SMEAR II station. In future, more emphasis will be put on effective use of our long-term data sources, in order to be able to answer the grand challenges (environmental changes in decadal and regional scale, Earth system functioning).

More emphasis will be put on recruiting new staff across disciplines, among the highest-ranking international PhD students, post-docs and professors.

2 PRACTISES AND QUALITY OF DOCTORAL TRAINING (MAX. 8800 CHARACTERS WITH SPACES)

- How is doctoral training organised in the RC? Description of the RC's principles for recruitment and selection of doctoral candidates, supervision of doctoral candidates, collaboration with faculties, departments/institutes, and potential graduate schools/doctoral programmes, good practises and quality assurance in doctoral training, and assuring good career perspectives for the doctoral candidates/fresh doctorates.

ATM educated 46 doctors in 2005-2010. The ATM coordinates a multi-site national doctoral programme "Atmospheric Composition and Climate Change: From Molecular Processes to Global Observations and Models (ACCC)", and all the doctoral training within the ATM is done in the context of the doctoral programme. The ATM currently has 76 doctoral students. From the beginning of 2010, the core of the doctoral programme has included four universities, four research institutes, and five private enterprises. The doctoral programme is operating within the Strategic Centre for Science, Technology and Innovation in Energy and Environment, coordinated by CLEEN Ltd. Furthermore, the ATM has direct working connections to more than 80 international laboratories and has participated in more than 40 EU-projects. International collaboration is done e.g. within the Marie Curie Initial Training Network CLOUD-ITN, Nordic graduate school CBACCI, Nordic centres of excellence CRAICC and DEFROST, the iLEAPS IPO, EUSAAR, and ACCENT.

ACCC organizes an open, international doctoral student selection biannually, but we are able to take new doctoral students continuously depending on the current research needs and project funding. In the application stage, the candidate must submit personal information, a letter of motivation, an initial research plan, a statement by the supervisor in master studies, and a copy of the master's degree certificate including the transcript of studies.

Generally, the applications are ranked according to the following guidelines:

- suitability of master's degree studies
- grades in master's degree studies
- number and quality of publications (peer reviewed journals, peer reviewed conference papers)
- other scientific and technological merits
- initial research plan
- supervisors' statements

The top applicants are always interviewed. Special attention is paid to equality issues in the student selection. The aim is that there is a minimum representation of 40% of each gender. Currently there is a good balance between genders (47% of all students are female). The rules for the ranking are transparent, and are clearly communicated through the doctoral programme webpage.



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Each doctoral student has 2-3 supervisors, including at least one senior scientist who is internationally recognized. Furthermore, at least one of the supervisors is working in a very close scientific collaboration with the student. There are currently 37 docent-level supervisors linked to ATM, out of which 13 are professors.

In practice the doctoral training is organized the following way:

- providing core and transferable skills by a selection of courses, many of them given jointly with other universities and research institutes
- a well-specified research project
- 2-3 supervisors
- guidance groups
- participation in workshops and conferences
- mobility (national, international, cross-sector)

The ATM organizes annually:

- Joint summer and winter schools, field courses (totalling 4-6)
- Ad hoc courses (courses with special emphasis on a very current research topic)
- Workshops and conferences (local, national and international):
 - Annual workshop of the ACCC doctoral programme
 - Annual workshop for teachers and supervisors
 - ~10 other conferences and workshops, very active participation in national and international conferences and workshops
- E-learning courses (2-5, usually organized jointly)

In the beginning of PhD studies, each student prepares a study and research plan, identifying the skills to be developed (the gap between the current situation and the desired outcome) and educational activities, including courses and training on transferable skills, needed to meet the goals in the specific time window (usually 4 years). The personalized projects often include inter-sectoral visits and/or secondments to another institution in Finland or abroad. The study plans are designed by recognising the whole research career. Also the prospects for the postdoc period and after that are taken into account.

During the studies, each student participates in courses and workshops organized jointly by the ACCC partners and/or some of the international networks (CBACCI, CRAICC, DEFROST, CLOUD-ITN etc.).

The general timeline of doctoral studies:

- Yr 1: Summer school, winter school, courses, workshop, research
- Yr 2: Courses (focus on training in transferable skills), workshop, research
- Yr 3: Research, manuscripts, papers, workshop, seminar course
- Yr 4: Ph.D. thesis final papers ready, summary

Each doctoral student participates in one or two guidance groups. A guidance group typically consists of 5-8 students and 2-3 supervisors. The group meets every second week. In the group meetings the students report their progress, which is then discussed. Currently there are altogether 13 guidance



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groups operating. Joint supervision is a common practice, and currently more than 40% of the students have supervisors from at least 2 departments/institutes.

The supervisors for individual students are selected according to a) needs of students, b) the research needs, and c) the capacity and experience of the supervisor.

The ATM is frequently requested to provide candidates for international tasks in universities and research institutes abroad. These tasks represent an important and rapidly growing area in our fields. The appreciation of the excellence in Finnish research has led to a situation where the doctors trained here have become desirable for foreign research institutes and universities. Environmental consultancy as well as industrial research and development tasks are becoming more important. Career planning is a solid part of the studies. In practice the career planning is done within guidance groups and in other supervision meetings. Some of the students are involved in innovation systems and/or mentoring programmes of private enterprises.

The general guidelines and good practices within the ATM include:

- Maintenance, development and dissemination of best practices
- Open and transparent recruitment policy
- Active participation on the national and international policy and education system development
- Use of external evaluation (ACCC)
- Continuation of commitment on all levels (students, postdocs, senior scientists, professors)

The doctoral education within the ATM is constantly evaluated both by self-assessment and by the External Advisory Board of the ACCC doctoral programme. When evaluating the doctoral programme, the following criteria are taken into account:

- Employability of graduates
 - Quality and nature of core and transferable skills
 - Universities' ability to foresee future challenges in science & society
- The graduates' ability to carry out independent, original research work
- Quality of research
 - Publications in high-impact journals
 - Number of publications
- Structured and dedicated supervision

Internal evaluation is carried out on different levels. Students of the programme serve as a valuable source of criticism and new ideas of developing the training. Student feedback is collected from all educational events. The feedback is processed after each event, and collected in a database. The guidance groups provide a common, permanent, well-working feedback system. The ACCC programme arranges an annual 2-day workshop for the teachers and supervisors to further improve their skills to advise students. The meetings include discussions e.g. on quality assurance and self-assessment in teaching and supervision, intercultural supervision and education, and ethics in science.

- RC's strengths and challenges related to the practises and quality of doctoral training, and the actions planned for their development.

The ATM and the whole ACCC programme follows the Standards and Guidelines for Quality Assurance in the European Higher Education Area (www.enqa.eu).



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ATM's strengths and challenges related to the practises and quality of doctoral training, and the actions planned for their development:

- coordination of a well organized national doctoral programme
- effective use of external experts (advisory board)
- dedicated supervisors
- professionally organized joint training events (summer and winter schools, field courses, e-learning courses) provide the students with an easy access to national and international collaboration and enable them to form their own networks already during doctoral studies
- a rapidly growing research community in the ATM's research areas in Finland creates challenges in the general coordination of doctoral training

3 SOCIETAL IMPACT OF RESEARCH AND DOCTORAL TRAINING (MAX. 4400 CHARACTERS WITH SPACES)

- Description of how the RC interacts with and contributes to the society (collaboration with public, private and/or 3rd sector).

The main philosophy of ATM is to support and promote creative thinking and research. Creative and innovative research needs strong national and international collaboration and communication between science community and society. ATM is not only distributing scientific knowledge but also keeping up constant dialogue with decision makers, private and public sector.

All the scientific results are published in international peer-reviewed journals. In addition to international peer-reviewed journals, scientific results are published in various report, newsletters, conference publications and short popular scientific articles. Stakeholders and key data-user groups have also been invited to some of ATM meetings.

The ATM research contributes directly to current debate on climate change and air quality issues by delivering valuable state-of-the-art data for science policy and policy making processes. ATM contributes its science findings to international assessments, e.g. IPCC assessment reports. ATM findings are also relevant to international climate negotiations (COP/CMP), the Vienna Convention on the Protection of the Ozone Layer and the Convention of Long-range transport of Air Pollutants. Several ATM scientists are members of expert panels e.g. of funding agencies and working groups of ministries.

The non-scientific end-users of the data are informed using distributed written material and press conferences, which generates interviews and articles in popular science magazines and in domestic and international newspapers as well as in the television and radio. ATM is founding member in several platforms for outreach, such as Hiukkastieto (www.hiukkastieto.fi/) for aerosol information, Hiilipuu (www.hiilipuu.fi) for illustration of CO₂ fluxes of boreal tree and ympäristötiedon foorumi (www.ymparistotiedonfoorumi.fi), which is collaborative network of actors in environmental science to promote dialogue between scientists and decision makers at different levels. ATM is partner in University of Helsinki fundraising campaign with the climate change theme.

Members of ATM are presently working also in close co-operation with elementary and high schools to familiarize pupils and students with analyses of environmental data and the scientific world. This was realized e.g. in the Nordic Climate Day 2010 activities with expert visits in 16 elementary schools, and by participating in organizing the Millennium Youth Camp in 2010.

There is co-operation with several private enterprises. The ATM co-operates with the CLEEN Ltd. ATM is also a member of "Business from the innovation pipeline – commercialization of cleantech innovations" -project, which is aiming for commercialized know-how, new enterprises and jobs. ATM has several active partners in private sector e.g. Vaisala Oyj, Nokia Oyj, Beneq Oy, Space Systems Finland Oy,



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Helsinki Aerosol Consulting Oy, and Airmodus Oy. The last two on the list are spin-off companies of the ATM.

- Ways to strengthen the societal impact of the RC's research and doctoral training.

ATM will continue its active role by distributing scientific knowledge via national and international publications, assessment reports, participating in expert panels and public discussion on climate change and air quality matters. ATM strengthens its role in outreach platforms and on constructing European environmental research infrastructures with open data access and visualization of data.

Our goal in PhD training is to educate people for the future challenges of the society. A specific aim is to enhance the settling on the private sector after obtaining the PhD degree. Projects and training events involve students and researchers from universities, research institutes as well as private companies. The students learn to work in research enterprises, particularly in co-operation with FiDiPro Professors, Dr. D. R. Worsnop (vice president of Aerodyne Research, Inc., and the director of the Center for Aerosol and Cloud Chemistry) and Dr. V. Chandrasekar (Deputy director and director of research of NSF/CASA). This will enhance the innovation networks and chains in Finland.

4 INTERNATIONAL AND NATIONAL (INCL. INTERSECTORAL) RESEARCH COLLABORATION AND RESEARCHER MOBILITY (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the RC's research collaborations and joint doctoral training activities and how the RC has promoted researcher mobility.

Figure 1 shows the main network and partnership related to research, education and knowledge transfer and research infrastructures. The research collaboration promotes research mobility. We have active collaboration with ca 80 different research laboratories and we have participated in over 40 EU projects.

National

ATM is a core in FCoE (other partners FMI and UEF). ATM also coordinates national graduate school and operates SMEAR stations. The infrastructure project ICOS-Finland (Integrated Carbon Observation System) was funded as one of the first at the European level for its construction phase, and is ready to launch the operation phase in 2012. This funding helps the whole ESFRI ICOS to materialize its operations in the future. ATM hosts international visiting scientists, e.g. the FiDiPro D. Worsnop and V. Chandrasekar (Acad. of Finland).

Nordic/Baltic

ATM is an important partner in Nordic climate change and atmospheric research. We participate in many Nordic research initiatives, e.g. the Nordic Top Research Initiative for climate, energy and environment. Two new Nordic CoEs, CRAICC (Coordinator: Kulmala) and DEFROST (PI Vesala) were funded by NordForsk in years 2010-2015. ATM participated in writing the NordForsk Policy Brief on Nordic Climate Change Research. NordForsk is funding several networking activities, e.g. the 'NordFlux', the 'Charged clusters in the atmosphere' and the 'Nordic-Baltic BACCI'. ATM coordinates Nordic graduate school CBACCI and master program ABS. The planning of SMEAR Estonia started in 2009.

European

The ATM is working closely with European Research Area initiatives. We have been active in ESFRI infrastructures, such as ICOS, planning of European aerosol and atmospheric chemistry infrastructure (ACTRIS I3), and enhancing collaboration between European environmental RIs.



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Members of ATM have been active in preparing the Joint Programming Initiative on decadal climate predictability and developing of better climate services for end-users (Connecting Climate Knowledge for Europe, Clik'EU). ATM is a member of Marie Curie CLOUD-ITN (2008-12), and was a member of Marie Curie-iLEAPS (2004-08). ATM is a partner of European network of excellence, ACCENT - Atmospheric Composition Change, with various mobility and training schemes. ATM has also participated many EU projects. Currently Kulmala coordinates FP6 IP EUCAARI, which has 48 partners from 23 different countries.

Global

ATM is an active partner in the global change research community, e.g. hosting the International Project Office of iLEAPS, Integrated Land Ecosystem – Atmosphere Processes Study. iLEAPS organized two large science conferences in Boulder (2006) and in Melbourne (2009). From beginning of 2010, Kulmala has been a co-chair of the iLEAPS. ATM is also participating on the IPCC AR5 processes and future developments of the global research programmes (IGBP/WCRP). ATM organized the International Aerosol Conference in Helsinki in 2010 (ca 1500 participants).

ATM has also collaboration with non-European research institutions, e.g. with Chinese research bodies in building of joint SMEAR station near Nanjing. ATM is taking part in operation of atmospheric measurement station in South Africa and planning one in Saudi Arabia.

- RC's strengths and challenges related to research collaboration and researcher mobility, and the actions planned for their development.

The main strength is the multi- and interdisciplinary nature of our international network. Within this network we are able to find out the best available knowledge to answer our research questions. The network also enables us to provide good international mobility to our researchers, and attracts excellent visiting scientists.

One of the key challenges is the development of ICOS (Integrated Carbon Observation System). ICOS is a new European Research Infrastructure for quantifying and understanding the greenhouse gas balance of the European continent and of adjacent regions ATM partners are preparing to host ICOS headquarters in the future. Members of the ATM are promoting the European Institute of Atmospheric Sciences and Earth System Research, EINAR, which could provide integrated European vision and research strategy and long-term funding for the research community in the future.

5 OPERATIONAL CONDITIONS (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the operational conditions in the RC's research environment (e.g. research infrastructure, balance between research and teaching duties).

Understanding the complex, non-linear system requires a diverse range of scientific and technological expertise in the areas of chemistry, physics, biology, and meteorology, and involves laboratory studies, ground, ship, and airborne field studies, satellite remote-sensing and numerical modelling studies ranging from the molecular ab initio level to the global scale Earth system models (See Figure 2). Our operational conditions cover all those observational, experimental and theoretical aspects.

In practice we start from molecular simulations (Monte Carlo and Molecular Dynamics) to understand nucleation and aerosol thermodynamic processes. These microscopic processes of nucleation together with condensation/evaporation and coagulation are required to understand aerosol dynamics, particle concentrations and composition. Significant advances in laboratory data and modelling techniques are needed for a number of important aerosol systems. Similarly, photosynthesis, autotrophic respiration



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and VOC synthesis are modeled in cell, stomatal and leaf scales together with chamber measurements in laboratory and field. Fundamental aerosol and carbon cycle processes need to be understood in order to quantify aerosol radiative properties and the influence of aerosols on cloud microphysics and dynamics at the scale of individual clouds, and to understand changes in carbon uptake dynamics. At larger scales, advances in understanding of boundary layer meteorology are needed to understand atmospheric aerosol transport, trace gas (e.g. CO₂, methane, N₂O, O₃, SO₂, NO_x, VOCs) and water vapor exchange and deposition processes. Boundary layer studies form a link to regional-scale processes and further to global-scale phenomena. For simulating global climate and air quality, the most recent progress on this chain of processes must be compiled, integrated and implemented in Climate Change and Air Quality numerical models via novel parameterizations.

The backbone of our research infrastructure are the three SMEAR (Station for Measuring Forest Ecosystem- Atmosphere Relations) stations. The main idea of SMEAR-type infrastructures is continuous, comprehensive measurements of fluxes, storages and concentrations in the land ecosystem–atmosphere continuum. The major coupling mechanisms between atmosphere and land surface are the fluxes of energy, momentum, water, carbon dioxide, atmospheric trace gases and atmospheric aerosols. The SMEAR II station is a flagship measurement station, currently accepted in the ICOS network as an atmospheric and full ecosystem station.

The majority of ATM staff is funded with external funding sources. However, all ATM members participate in teaching, either as giving lectures or guiding group works and practical trainings. This enables the rapid use of up-to-date scientific results in teaching, and also facilitates recruitment of the best students. The balance between teaching and research is maintained through distributing the teaching load between all group members. Supervision of students is also divided between senior scientists and junior group members.

- RC's strengths and challenges related to operational conditions, and the actions planned for their development.

Strengths:

- innovative, effective, productive
- supradisciplinary, holistic approach
- strong focus area (forest-atmosphere interactions, nucleation, instrument development, fluxes, comprehensive, long-term series)
- direct contact networks (education, science, science policy)
- solid infrastructures
- high motivation level, unlimited challenges
- inspiring work environment (informal atmosphere, talented personnel, support, tolerance towards dissimilarity)
- comprehensive education
- international orientation
- good reputation in delivering

Challenges:

- insufficient technical staff
- uncertainties related to funding
- further development of world class infrastructures



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RC-SPECIFIC STAGE 2 MATERIAL

- to keep and strengthen leading position in atmospheric aerosol science and atmosphere-biosphere interactions
- to utilize optimally the different disciplines inside ATM

Planned actions:

- ensure future funding flows
- recruit outstanding staff
- continue development of SMEAR stations
- find new strategic and scientific openings
- participation of international activities

6 LEADERSHIP AND MANAGEMENT IN THE RESEARCHER COMMUNITY (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the execution and processes of leadership in the RC, how the management-related responsibilities and roles are distributed in the RC and how the leadership- and management-related processes support high quality research, collaboration between principal investigators and other researchers in the RC, the RC's research focus and strengthening of the RC's know-how.

The ATM is formed by researchers from two faculties and three departments at UHEL. The core of the unit is the Finnish Center of Excellence in Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change (FCoE), led by Acad. Prof. Markku Kulmala who is also the chair of the FCoE Board. The vice chair is Prof. Timo Vesala, and also Prof. Eero Nikinmaa and Prof. Marja-Liisa Riekkola are members of the Board. The practical issues within ATM are coordinated by Research coordinator Jaana Bäck, who also is the Secretary General in the Nordic CoE CRAICC. Teaching coordination is done by university lecturer Antti Lauri. Besides FCoE members the whole division of Atmospheric Sciences from Department of Physics belongs to ATM. The division is led by M. Kulmala.

ATM has international scientific leadership in atmospheric aerosol science (M. Kulmala) and in biogeochemical cycles (T. Vesala) (see also Figure 1.).

The scientific work is divided into smaller thematic sub-groups, which all utilize the common strategic plan. A Planning Group, where senior scientists and all sub-group leaders are involved, is participating in strategic planning within the ATM. Empowerment project for planning group members to develop leadership skills and practices was organized between 2008-9. The administrative issues and information flow are facilitated in the ADMIN group where also practical plans and day-to-day administrative duties are handled. All meetings produce written minutes.

Information flow is organized through:

- regular small-group meetings
- weekly department level meetings and seminars
- annual or bi-annual project meetings
- e-mail lists
- web site

International and science policy issues are handled by all senior scientists, with help from ICOS Finland, iLEAPS IPO and Dr Sanna Sorvari, who is coordinating those activities.



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- RC's strengths and challenges related to leadership and management, and the actions planned for developing the processes.

Strengths: ATM has been formed around a common scientific framework, which creates an inspired atmosphere and facilitates group management. The world class scientific leadership can be seen in outstanding results (Nature/Science papers, ERC grants etc.). Coordination of research and education are closely linked together and all ATM members are involved in both.

The challenges related to leadership and management are:

- interdisciplinary work
- size of the group
- information flow and daily management
- unfavorable changes in research politics in Finland, changes in external support and collaboration
- inbreeding, lack of 'fresh blood'

Actions planned:

- improving internal science policy planning, clarifying research strategies and responsibilities
- Interaction and communication between fields and disciplines strongly encouraged
- Coaching and mentoring as means of empowerment at all stages
- Information flow and daily management challenges; more effective meetings
- Recruitment strategy to ensure inflow of people from other universities in Finland and abroad

7 EXTERNAL COMPETITIVE FUNDING OF THE RC

- Listing of the RCs external competitive funding, where:
 - the funding decisions have been made during 1.1.2005-31.12.2010, and
 - the administrator of the funding is/has been the University of Helsinki
- Academy of Finland (AF) - total amount of funding (in euros) AF has decided to allocate to the RC members during 1.1.2005-31.12.2010: 14600000
- Finnish Funding Agency for Technology and Innovation (TEKES) - total amount of funding (in euros) TEKES has decided to allocate to the RC members during 1.1.2005-31.12.2010: 3800000
- European Union (EU) - total amount of funding (in euros) EU has decided to allocate to the RC members during 1.1.2005-31.12.2010: 12800000
- European Research Council (ERC) - total amount of funding (in euros) ERC has decided to allocate to the RC members during 1.1.2005-31.12.2010: 4500000
- International and national foundations – names of international and national foundations which have decided to allocate funding to the RC members during 1.1.2005-31.12.2010, and the amount of their funding (in euros).
 - names of the foundations: Nessling Foundation
 - Aaltonen Foundation
 - King Carl XVI Gustaf Environmental Research Foundation



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- Finnish Academy of Science and Letters
 - Finnish Physical Society
 - Wihuri Foundation
 - Societas Scientiarum Fennica, Magnus Ehrnrooth Foundation
 - The Finnish Work Environment Fund
 - Finnish Forest Foundation
 - Finnish Association for Aerosol Research
 - total amount of funding (in euros) from the above-mentioned foundations: 1110000
- Other international funding - names of other international funding organizations which have decided to allocate funding to the RC members during 1.1.2005-31.12.2010, and the amount of their funding (in euros).
 - names of the funding organizations: University of Ghent
 - Aerodyne US
 - Nordforsk
 - COST
 - total amount of funding (in euros) from the above-mentioned funding organizations: 1230000
- Other national funding (incl. EVO funding and Ministry of Education and Culture funded doctoral programme positions) - names of other national funding organizations which have decided to allocate funding to the RC members during 1.1.2005-31.12.2010, and the amount of their funding (in euros).
 - names of the funding organizations: Nokia Ltd
 - Vaisala Ltd
 - SHOK Forestcluster LTD
 - SHOK CLEEN Ltd
 - University of Helsinki
 - CSC
 - Ministry of Education
 - Ministry of Agric & Forestry
 - City of Vantaa
 - City of Malmö
 - total amount of funding (in euros) from the above-mentioned funding organizations: 1700000

8 RC'S STRATEGIC ACTION PLAN FOR 2011–2013 (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the RC's future perspectives in respect to research and doctoral training.

Period 2011-2013 is characterized by investments

 - to large scale infrastructure such as:
 - o ICOS, ACTRIS, INAR/EINAR
 - o SMEAR stations
 - to instrument development coupled with theoretical understanding, with potential spin off applications
 - o mass spectrometers
 - o CPCs, AIS/NAIS



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- to deeper understanding of processes related to e.g. atmospheric nucleation, soil chemistry, biophysics and –chemistry of photosynthesis, and biosphere-atmosphere interactions
- to harmonization of data bases e.g. related to SMEAR stations and international research networks
- to develop models from molecular level to global scale
- to participate and lead international laboratory experiments like CLOUD/CERN and develop further own laboratory facilities
- to national and international co-operation like
 - o SHOK (CLEEN, Forestcluster)
 - o JPIs
 - o new directions in global change community (Earth System visioning processes by ICSU)
 - o deeper co-operation with existing FiDiPros Worsnop and Chandrasekar and finding out new potential FiDiPros

Research action plan is conducted at research group level. Each main topic is organized in guidance groups and near future plans are discussed between researchers at all levels of seniority. In research we will concentrate on interlinks, interconnections and feedbacks related to soil-biosphere-cryosphere-atmosphere continuum including natural and anthropogenic effects on climate change and air quality.

Main tools to develop:

- Instrument development
- Laboratory experiments
- Atmospheric observations
- Molecular-scale simulations
- Kinetic modelling
- Aerosol dynamic and atmospheric chemistry modeling
- Boundary layer Modelling
- Global models
- Satellites

ATM will recruit new staff and students across disciplines and also outside of the ATM community (other Universities in Finland and abroad) based on recruitment plan made by the ATM planning group. ATM will improve curriculum and resources related to that, and streamline the educational offering by structuring the courses and developing supervision and supervision groups.

Based on our expertise we will establish new spin off companies and co-operate intensively with existing ones. ATM will also work for employment of students via active contacts to future employers of environmental experts (e.g. FMI, SYKE, Metla, CSC, private companies, etc).

Future perspectives for next 5-10 years include clear and ambitious visions for empirical and experimental (laboratory, field, instrument developing) as well as theoretical (basic theories, simulations, model development) investigations.



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In research/science we will participate in

- Reducing scientific uncertainty in climate change
- Solving atmospheric nucleation and initial steps of particle growth
- Understanding of climate/Earth System functioning
- Understanding of interlinkages, feedbacks etc. between (eco)systems and atmosphere
- Scaling-up of ecophysiological processes over long time spans and across wider regions
- Understanding Air quality – climate change interactions

In science policy we will focus on

- to have UHEL in the frontline in climate change research
- to strengthen research resources from national and international sources
- taking and keeping leading role in global initiatives

Our societal perspectives are

- Adaptation and mitigation of climate change
- Dissemination of research findings (for policy making processes)
- From research to innovations; SMEs
- Training of multi-talented environmental and atmospheric experts

Particularly we will focus on training in all levels (MScs, PhD students, post docs and senior scientists). We will further develop our curriculum to answer multi-scale, supra-disciplinary requirements. In doctoral training we have international focus, and teach students to write clear research papers and proposals.

The doctoral training is organized the following way:

- providing core and transferable skills by a selection of courses, jointly with other universities and research institutes
- a well-specified research project
- 2-3 supervisors
- guidance groups
- participation in workshops and conferences
- mobility (national, international, cross-sector)

However, we will further develop it to provide to students active connections to society, private companies, international organizations etc.

9 SHORT DESCRIPTION OF HOW THE RC MEMBERS HAVE CONTRIBUTED TO THE COMPILATION OF THE STAGE 2 MATERIALS (MAX. 1100 CHARACTERS WITH SPACES).

The stage 2 materials were compiled by all ATM members. The answers to specific questions were compiled by Markku Kulmala, Jaana Bäck, Sanna Sorvari, Antti Lauri and the 'strategy group' (members: Kaarle Hämeri, Tuukka Petäjä, Miikka Dal Maso, Taina Ruuskanen, Dmitri Moiseev, Jaana Bäck). Comments and input to strategy were also provided by Eero Nikinmaa, Annikki Mäkelä, Timo Vesala, Michael Boy, Anni Reissell and Mari Pihlatie. All members filled in the TUHAT database regarding their publications and activities between 2005-2010.

ATM/Markku Kulmala Stage 2 figures

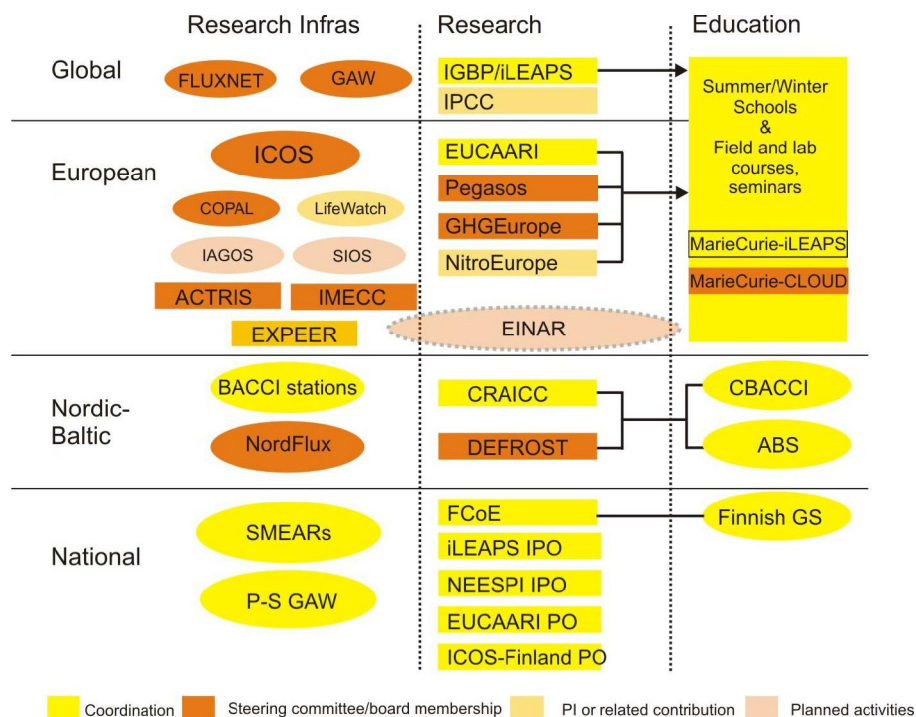


Figure 1. Research and education networks utilized in ATM at national, Nordic-Baltic, European and global levels.

Abbreviations:

ABS=Atmosphere-Biosphere Studies; ACTRIS = European aerosol and atmospheric chemistry infrastructure; BACCI= Biosphere-Aerosol-Cloud-Climate Interactions; CBACCI=Carbon- Biosphere-Atmosphere-Cloud-Climate-Interactions; CLOUD = Cosmics Leaving Ooutdoor Droplets; COPAL= COMmunity heavy-PAYload Long endurance Instrumented Aircraft for Tropospheric Research in Environmental and Geo-Sciences; CRAICC= Cryosphere-Atmosphere Interactions in a Changing Arctic Climate; DEFROST = A changing cryosphere – depicting ecosystem-climate feedbacks as affected by permafrost, snow and ice; EINAR= European Institute of Atmospheric Sciences and Earth System Research; EUCAARI= European Integrated Project on Aerosol-Cloud-Climate-Air Quality Interactions; EUSAAR= European Supersites for Atmospheric Aerosol Research; EXPEER = Distributed Infrastructure for EXPErimentation in Ecosystem Research; FCoE=Finnish Centre of Excellence in Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change; FLUXNET = Integrated CO2 flux measurement network; GHGEurope = Greenhouse gas management in European land use system (<http://www.ghg-europe.eu/>); GAW = Global Atmospheric Watch; GS= Finnish graduate school; IAGOS= In-service Aircraft for Global Observing System; ICOS =Integrated Carbon Observation System; IGBP= International Geosphere-Biosphere Program; iLEAPS=integrated Land Ecosystem Atmosphere Processes Study; IMECC= Infrastructure for Measurements of the European Carbon Cycle; IPCC = Intergovernmental Panel for Climate Change; LifeWatch = e-science and technology infrastructure for biodiversity data and observatorie;s NordFlux = A Nordic research network for greenhouse gas exchange from northern ecosystems; P-S GAW= Pallas- Sodankylä Global Atmosphere Watch Station; PEGASOS= Pan-European Gas-Aerosols-climate interaction Study; SIOS= Svalbard Integrated Arctic Earth Observing System; SMEAR=Station for Measuring Ecosystem-Atmosphere Relations

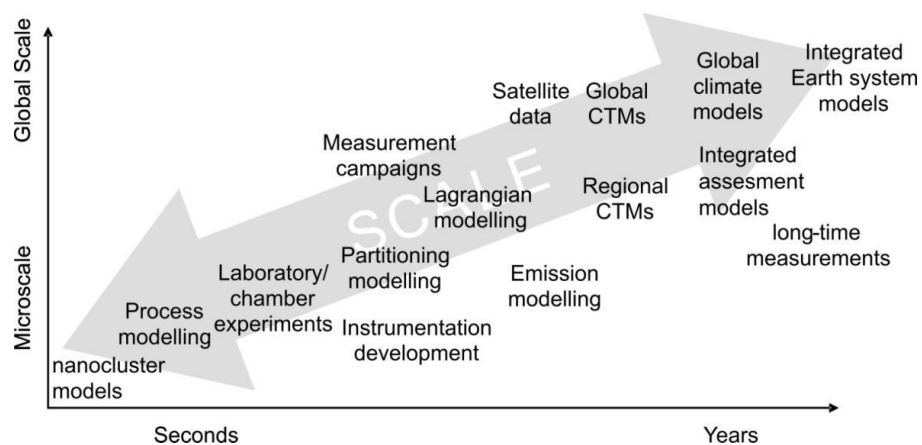


Figure 2. Model and Data Integration Philosophy over spatio-temporal scales. CTM = Chemical Transport Model



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RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

ATM/Kulmala

1 Analysis of publications

- Associated person is one of Juho Aalto , Pasi Pekka Aalto , Hermann Aaltonen , Nuria Altimir , Almut Arneth, Ari Asmi , Eija Asmi , Jaana Bäck , John Carl Gustav Backman , Marja Bister , Anatoli Bogdan , Boris Bonn, Michael Boy , Gerardus De Leeuw , Remko Duursma, Mikael Kristian Ehn , Stephanie Gagne , Sabine Göke , Pertti Hari , Kari Hartonen , Kaarle Hämeri , Emmi Hilasvuori , Teemu Anca Hienola , Leena Järvi , Jan Daniel Julin , Heikki Tareq Hussein , Eija Juurola , Maija Karoliina Kajos , Matti Aleksanteri Jussila , Antti-Jussi Kieloaho , Pasi Kolari , Gaby Katul, Petri Ilkka Rinaldo Keronen , Liisa Kulmala , Markku Kulmala , Theo Christian Kurten , Ella-Maria Kyrö , Lauri Laakso , Totti Tapio Laitinen , Hanna K Lappalainen, Samuli Launiainen , Antti Johannes Lauri , Johanna Lauros , Katrianne Lehtipalo , Janne Levula , Li Liao , Aki Linden , Ville Loukonen , Anni Elisa Määttänen, Annikki Mäkelä-Carter , Risto Juhani Makkonen , Ivan Mammarella , Hanna Elina Manninen , Matthew McGrath , Joonas Merikanto , Dmitri Moisseev , Bjarke Mølgaard , Eero Nikinmaa , Ismo Ilmari Napari , Tuomo Nieminen , Pauli Paasonen , Mari Pihlatie , Toivo Annika Nordbo , Ismael Kenneth Ortega Colomer , Martti Kimmo Perämäki , Tuukka Petaja , Nonne Prisle , Jukka Pumpanen , Ullar Rannik, Terhi Rasilo , Ilona Pohja , Albert Porcar-Castell , Jouni Räsänen , Maarit Raivonen , Anu Riikonen , Jose Ruiz-Jimenez , jose.ruiz- Hannu Savijärvi , Riipinen , Janne Rinne , Laura Irmeli Riittanen , Kai Ilmari Ruusuvaara , Sanna Sevanto , Mikko Juhani jimenez@helsinki.fi, Taina Ruuskanen , David Schultz , Anu-Maija Sundström , Marin Tomasic , Tanja Suni , Siegfried Schobesberger , Ville Vakkari , Larisa Sogacheva, Sanna Sorvari , Marko Vana , Joonas Vanhanen , Riikka Väänänen , Sipilä , Risto Taipale , Martta Toivola , Aki Olavi Virkkula , Henri Vuollekoski , Hanna Vehkamäki , Timo Vesala , Taina Yli-Juuti , Sergej Zilitinkevich , Douglas Worsnop ,

Publication type	Publication year						Total Count 2005 - 2010
	2005	2006	2007	2008	2009	2010	
A1 Refereed journal article	120	97	138	130	137	136	758
A2 Review in scientific journal	1	1	2	3		2	9
A3 Contribution to book/other compilations (refereed)		4	5	81	7	1	98
A4 Article in conference publication (refereed)	7	15	55	7	6	5	95
B1 Unrefereed journal article	2	5	7	6	11	6	37
B2 Contribution to book/other compilations (non-refereed)	2	73	2	3	3		83
B3 Unrefereed article in conference proceedings	33	79	22	106	86	86	412
C1 Published scientific monograph			1	1	2	1	5
C2 Edited book, compilation, conference proceeding or special issue of journal	3	5	1	7	2	1	19
D1 Article in professional journal		1			1	9	11
D2 Article in professional hand or guide book or in a professional data system, or text book material	1		4	1			6



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Publication type	2005	2006	2007	2008	2009	2010	Total Count 2005 - 2010
D4 Published development or research report			1			1	2
D5 Text book or professional handbook or guidebook or dictionary		1		1	3	4	9
E1 Popular article, newspaper article	4	4	3	2	3	4	20
E1 Popular contribution to book/other compilations	2	1					3
E2 Popular monograph		1					1
H1 Patents		1			2		3
I2 ICT programs or applications					1		1



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2 Listing of publications

A1 Refereed journal article

2005

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2009

Kulmala, M, Bäck, J, Nieminen, T, Lauri, A (eds) **2009**, *Proceedings of the Finnish Center of Excellence and Graduate School in "Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change" Annual Workshop 27.-29.4.2009*, **Report Series in Aerosol Science, no. 102, Aerosolitutkimusseura, Helsinki**.

Kulmala, M, Bäck, J, Nieminen, T, Lauri, A (eds) **2009**, *Proceedings of the Finnish Center of Excellence and Graduate School in "Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change" Annual workshop 27.-29.4.2009*, **Report series in aerosol science, no. 102, Finnish Association for Aerosol Research, Helsinki**.

2010

Gutman, G, Reissell, A (eds) **2010**, *Eurasian Arctic Land Cover and Land Use in a Changing Climate*, **Springer**.

D1 Article in professional journal

2006

Kulmala, M, Hari, P **2006**, 'Taisto Raunemaa (1939-2006), aerosolitutkimuksen suunnannäyttaja: muistikirjoitus', **Arkhimedes**, vol 2006, no. 4, pp. 6.

2009

Bäck, J, Lauri, A, Kulmala, M **2009**, 'Ilmakehän koostumuksen ja ilmaston muutoksen fysiikan, kemian, biologisen ja meteorologian huippuyksikkö', **Arkhimedes**, vol 2009, no. 3, pp. 24-28.

2010

Fisher, JB, Zardin, E, Bocquet, F, Swann, A, Rüdiger, C, Kyrö, E, Gunthe, SS **2010**, 'The New Generation of 'Land-Atmosphere Exchange' Scientists', **iLEAPS Newsletter**, no. 9, pp. 47-49.

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Pylkkänen, M, Riikonen, A **2010**, 'Kohtuutta kattamiseen', **Viherympäristö**, no. 2, pp. 14-15.

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Vehkamäki, H **2010**, 'Kehdosta tieteen huipulle: Douglas Worsnop', **Arkhimedes**, vol 2010, no. 4, pp. 14-17.

Vehkamäki, H **2010**, 'Millainen on ensimmäisen Aalto-professorin Risto Niemisen alämäntarina?', **Arkhimedes**, vol 2010, no. 2, pp. 22-26.

Vesala, T **2010**, 'Saunomisen sietämätön kuumuus', **Arkhimedes**, vol 2010, no. 4, pp. 28-29.

Väänänen, R **2010**, 'Kirja-arvostelu: Tapio J. Tuomi ja Antti Mäkelä: Ukkosta ilmassa', **Arkhimedes**, vol 2010, no. 1, pp. 24.



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UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

ATM/Kulmala

D2 Article in professional hand or guide book or in a professional data system, or text book material

2005

Räsänen, J, Ruokolainen, L **2005**, 'Some new results on regional climate change', **CSC report on scientific computing 2004-2005, CSC, Espoo**, pp. 167-169.

2007

Herrmann, E **2007**, 'Fluid dynamics and nucleation simulations with Fluent and the Fine Particle Model', in A Sillanpää, J Fagerholm, S Kotila, J Ahokas, P Forsström, E Järvinen, A Sarén, J Tarus, E Vitie (eds), **CSC REPORT ON COMPUTATIONAL SCIENCE IN FINLAND 2006-2007**, vol. 2007, **CSC - Scientific Computing Ltd., Espoo, Finland**, pp. 137-139.

Nikinmaa, H, Porcar-Castell, A, Pursula, T **2007**, 'Side-streams as a feedstock to biorefinery', in R Hermans, M Kulvik, H Nikinmaa (eds), **Biotechnology as a competitive edge for the Finnish forest cluster, The research institute of the Finnish economy-ETLA B Series, no. 227, Taloustieto, Helsinki**, pp. 67-72.

Nikinmaa, H, Porcar-Castell, A **2007**, 'Biotechnology Applications in Timber Processing', in R Hermans, M Kulvik, H Nikinmaa (eds), **Biotechnology as a competitive edge for the Finnish forest cluster, Elinkeinoelämän tutkimuslaitos (ETLA). Sarja B, no. 227, Taloustieto, Helsinki**, pp. 47-54.

Nikinmaa, H, Porcar-Castell, A **2007**, 'Biotechnology applications in Forestry', in R Hermans, M Kulvik, H Nikinmaa (eds), **Biotechnology as a competitive edge for the Finnish forest cluster, Elinkeinoelämän tutkimuslaitos (ETLA). Sarja B, no. 227, Taloustieto, Helsinki**, pp. 27-46.

2008

Kulmala, M **2008**, 'On aerosol particles in earth system models', **CSC report on computational science in Finland 2006-2007, CSC - Scientific Computing Ltd., Espoo**, pp. 28-31.

D4 Published development or research report

2007

Hakala, T, Haltia, O, Hermans, R, Kulvik, M, Nikinmaa, H, Porcar-Castell, A, Pursula, T **2007**, *Biotechnology as a competitive edge for the Finnish forest cluster*, **Keskustelunaiheita - Discussion papers / ETLA, no. 1076, Research Institute of the Finnish Economy, Helsinki**.

2010

Riikonen, A, Nikinmaa, E **2010**, *Viikin katupuuhanke – seurantaraportti*, **Helsingin kaupungin rakennusviraston julkaisut. Katu- ja puisto-osasto, no. 1, vol. 2010, Helsingin kaupungin rakennusvirasto, katu- ja puisto-osasto, Helsinki**.

D5 Text book or professional handbook or guidebook or dictionary

2006

Vehkamäki, H **2006**, *Classical nucleation theory in multicomponent systems*, **Springer, Berlin**.

2008

Kulmala, M, Hienola, J, Hämeri, K, Pirjola, L, Vesala, T **2008**, *Fysiikka, kemia ja ympäristöongelmat*, **Report series in aerosol science. Part B, no. 3, 1. p., muuttamaton lisäp. edn, Aerosolitutkimusseura, Helsinki**.

2009

Hämeri, K, Jokinen, R, Ketolainen, P, Sallinen, M, Sloan, M **2009**, *Empiria 1: Fysiikka luonnontieteessä*, **Otava, Helsinki**.

Rinne, J, Haapanala, S **2009**, *Meteorologinen mittalaitetekniikka*, **Report series in Aerosol Science, no. B9, vol. 2009, Yliopistopaino, Helsinki**.

Saari, P, Linko, L, Halttunen, J, Hartonen, K, Hiltunen, E, Hovinen, T, Järvenpää, E, Saxholm, S, Simonen, S **2009**, *Arkipäivän mittauksia*, **Metrologia, vol. J2, vol. J2, Mikes, Espoo, Finland**.

2010

Hyötyläinen, T, Riekkola, M **2010**, *Kaasukromatografia-massaspektrometria*, **Massaspektrometrian perusteet, Hakapaino Oy**.

Hämeri, K, Jokinen, R, Ketolainen, P, Sallinen, M, Sloan, M **2010**, *Empiria. 4: Liikkeen lait*, **Otava, Helsingissä**.



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Hämeri, K, Jokinen, R, Ketolainen, P, Sallinen, M, Sloan, M **2010**, *Empiria*. 3: *Aallot*, **Otava, Helsingissä**.

Hämeri, K, Jokinen, R, Ketolainen, P, Sallinen, M, Sloan, M **2010**, *Empiria*. 2: *Lämpö*, **Otava, Helsingissä**.

E1 Popular article, newspaper article

2005

Lauri, A **2005**, 'SMFL valmistautuu tieteen, taiteen ja teknologian kohtaamiseen', **TEK - tekniikan akateemiset**, vol 9, pp. 36.

Reissell, A **2005**, 'iLEAPS: vaihdanta maanpinnan ja ilmakehän välillä', **Tietoyhteys**, vol 8, no. 2, pp. 16-17.

Räisänen, J **2005**, 'Ilmastomallit ennustavat maapallon ilmaston muutoksia kasvihuoneilmiön voimistuessa', **TEK - tekniikan akateemiset**, vol 4, pp. 26-27.

Räisänen, J **2005**, 'Ilmastomuutos ja ääri-ilmiöt', **Tekniikka ja Talous**, pp. 11.

2006

Asmi, A, Kulmala, M **2006**, 'Investigations in aerosol-cloud-climate interactions: a need for supercomputers', **CSC news : superlaskennan tiedotuslehti**, vol 18, no. 4, pp. 25.

Lauri, A **2006**, 'Tervehdys SMFL:stä', **TEK - tekniikan akateemiset**, no. 2, pp. 32.

Räisänen, J **2006**, 'Miten kasvihuoneilmiön voimistuminen vaikuttaa Suomen säihin?', **Yliopiston almanakka vuodeksi ... jälkeen Vapahtajamme Kristuksen syntymän**, pp. 74-76.

Räisänen, J, Tuomenvirta, H **2006**, 'Maapallon keskilämpötilaa seurataan', **Helsingin Sanomat**, pp. C4.

2007

Hartonen, K, Aaltonen, O **2007**, 'Paineistetut fluiditekniikat monipuolistuvat elintarviketeollisuudessa', **Kehittyvä elintarvike**, vol 2007, no. 4, pp. 36-37.

Hermans, LFJ, Vesala, T **2007**, 'The sauna: revisited', **Europhysics news**, vol 38, no. 6, pp. 32.

Laaksonen, A, Viisanen, Y, Kulmala, M **2007**, 'Ilmastomuutokseen on varauduttava ajoissa', **Helsingin Sanomat**, pp. C 4.

2008

Räisänen, J **2008**, 'Lämpötilan nousu ei ole pysähtynyt', **Helsingin Sanomat**, pp. C6.

Sorvari, S, Kulmala, M **2008**, 'New opportunities for Finnish-Japanese Cooperation in Urban land-atmosphere and air quality research', **Koivu : the Finnish Institute in Japan Magazine**.

2009

Huuska, P, Räisänen, J **2009**, 'Kahden asteen ilmastotavoite on karkaamassa käsistä', **Helsingin Sanomat**, pp. C8.

Järvi, L **2009**, 'Maankäytön ja meteorologian vaikutukset Helsingin ilmanlaatuun', **Ilmansuojelu**, vol 2009, no. 4, pp. 10-11.

Räisänen, J **2009**, 'Hiilidioksidi ei poistu ilmakehästä nopeasti', **Helsingin Sanomat**, pp. C7.

2010

Riipinen, I **2010**, 'Positiivisessa valossa', **Yliopisto : Helsingin yliopiston tiedelehti**, vol 58, no. 2, pp. 46.

Riipinen, I **2010**, 'Vallan illuusio', **Yliopisto : Helsingin yliopiston tiedelehti**, vol 58, no. 11.

Riipinen, I **2010**, 'Ikävän arvoiset', **Yliopisto : Helsingin yliopiston tiedelehti**, vol 58, no. 6-7.

Räisänen, J **2010**, 'Ilmastomuutos ja heinäkuun helteet', **Ilmastokatsaus**, vol 15, no. 8, pp. 4-6.

E1 Popular contribution to book/other compilations

2005

Lappalainen, HK **2005**, 'Sää, ilmasto ja kasvit', in J Rinne, J Koistinen, E Saltikoff (eds), **Suomalainen sääkirja. etanasta El Niñoon.**, 4. painos edn, **Otava**.

Savijärvi, H **2005**, 'Ilmatieteen laitos ja meteorologia Helsingin yliopistossa', in H Nevanlinna (ed.), **Kaisaniemestä Kumpulaan. tutkimusta, havaintoja ja ihmisiä Ilmatieteen laitoksessa**, **Ilmatieteen laitos**, pp. 109-114.

2006



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RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

ATM/Kulmala

Kuuluvainen, T, Nikinmaa, E **2006**, 'Metsän rakenteen monet merkitykset', in R Jalonen (ed.), **Uusi Metsäkirja**, Gaudeamus, Helsinki, pp. 225-228.

E2 Popular monograph

2006

Jalonen, R (ed.), Hanski, I (ed.), Kuuluvainen, T (ed.), Nikinmaa, E, Pelkonen, P (ed.), Puttonen, P (ed.), Raitio, K (ed.), Tahvonen, OI (ed.) **2006**, *Uusi metsäkirja*, Gaudeamus, Helsinki.

H1 Patents

2006

Hartonen, K, Kerler, B, Riekkola, M May. 04 2006, *Continuous process for obtaining a product comprising at least one hydrogen isotope*, International patent application WO2006/045886.

2009

Hartonen, K, Kuuspallo, K, Lihavainen, H, Aalto, P, Rasilainen, M, Riekkola, M, Kulmala, M, Viisanen, Y Feb. 03 2009, *Sampling device for introduction of samples into analysis system*, US patent 7485854.

Venkatachalam, C, Nguyen, C, Moiseev, D May. 07 2009, *Dual-polarization radar processing system using time domain method*, 12387839.

I2 ICT programs or applications

2009

MOODS



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ATM/Kulmala

1 Analysis of activities 2005-2010

- Associated person is one of Juho Aalto , Pasi Pekka Aalto , Hermann Aaltonen , Nuria Altimir , Almut Arneth, Ari Asmi , Eija Asmi , Jaana Bäck , John Carl Gustav Backman , Marja Bister , Anatoli Bogdan , Boris Bonn, Michael Boy , Gerardus De Leeuw , Remko Duursma, Mikael Kristian Ehn , Stephanie Gagne , Sabine Göke , Pertti Hari , Kari Hartonen , Erik Hermann , Anca Hienola , Emmi Hilasvuori , Teemu Hölttä , Tareq Hussein , Leena Järvi , Jan Daniel Julin , Maija Karoliina Kajos , Heikki Junninen , Matti Aleksanteri Jussila , Eija Juurola , Antti-Jussi Kieloaho , Pasi Kolari , Gaby Katul, Petri Ilkka Rinaldo Keronen , Janne Henrik Korhonen , Liisa Kulmala , Markku Kulmala , Totti Tapio Laitinen , Theo Christian Kurten , Ella-Maria Kyrö , Lauri Laakso , Antti Johannes Lauri , Johanna Lauros , Katrianne Lehtipalo , Janne Levula , Li Liao , Aki Linden , Ville Loukonen , Anni Elisa Määttänen, Annikki Mäkelä-Carter , Risto Juhani Makkonen , Ivan Mammarella , Hanna Elina Manninen , Matthew McGrath , Joonas Merikanto , Dmitri Moiseev , Bjarke Mølgaard , Eero Nikinmaa , Ismo Ilmari Napari , Tuomo Nieminen , Pauli Paasonen , Mari Pihlatie , Toivo Annika Nordbo , Ismael Kenneth Ortega Colomer , Martti Kimmo Perämäki , Tuukka Petaja , Nonne Prisle , Jukka Pumpanen , Albert Porcar-Castell , Jouni Räisänen , Maarit Raivonen , Ullar Rannik, Terhi Rasilo , Ilona Riipinen , Janne Rinne , Laura Imeli Riuttanen , Jose Ruiz-Jimenez , jose.ruiz- Hannu Savijärvi , Mikko Juhani jimenez@helsinki.fi, Taina Ruuskanen , Kai Ilmari Ruusuvaari , Sanna Sevanto , Anu-Maija Sundström , Tanja Suni , Siegfried Schobesberger , David Schultz , Marin Tomasic , Joonas Vanhanen , Henri Vuollekoski , Riikka Väänänen , Sipilä , Larisa Sogacheva, Sanna Sorvari , Anu-Maija Sundström , Tanja Suni , Hanna Vakkari , Ville Vakkari , Martta Toivola , Marko Vana , Aki Olavi Virkkula , Taina Yli-Juuti , Sergej Zilitinkevich , Veikkamäki , Timo Vesala , Douglas Worsnop ,

Activity type	Count
Supervisor or co-supervisor of doctoral thesis	100
Prizes and awards	27
Editor of research journal	305
Editor of research anthology/collection/conference proceedings	14
Peer review of manuscripts	234
Editor of communication journal	3
Editor of series	2
Editor of special theme number	1
Assessment of candidates for academic posts	14
Membership or other role in review committee	25
Membership or other role in research network	32
Membership or other role in national/international committee, council, board	189
Membership or other role in public Finnish or international organization	49



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Activity type	Count
Membership or other role of body in private company/organisation	17
Participation in interview for written media	262
Participation in radio programme	21
Participation in TV programme	29
Participation in interview for web based media	3



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2 Listing of activities 2005-2010

Supervisor or co-supervisor of doctoral thesis

Almut Arneth

PhD supervision, B. Mantlana, Almut Arneth, 2005 → 2008

PhD supervision, D. Wärlind, Almut Arneth, 2008 → ...

PhD supervision, K Baumanns, Almut Arneth, 2010 → ...

PhD supervision, S.Olin, Almut Arneth, 2010 → ...

Jaana Bäck ,

PhD thesis supervisor, Nuria Altimir, Jaana Bäck, 01.01.1999 → 31.08.2006, Finland

PhD thesis supervisor, Hermann Aaltonen, Jaana Bäck, 01.01.2009 → ..., Finland

PhD thesis supervisor, Juho Aalto, Jaana Bäck, 01.01.2010 → ..., Finland

Marja Bister ,

Ph.D. thesis supervision, Marja Bister, 2003 → ..., Finland

Michael Boy ,

Supervision of doctoral student, Michael Boy, 01.07.2007 → 31.12.2010, Finland

Supervision of doctoral student, Michael Boy, 01.01.2009 → 10.12.2010, Finland

Supervision of doctoral student, Michael Boy, 01.01.2009 → 31.12.2010

Supervision of doctoral student, Michael Boy, 01.01.2009 → 31.12.2010

Supervision of doctoral student, Michael Boy, 01.01.2010 → 31.12.2010, Finland

Miikka Dal Maso ,

Co-supervision of PhD student: Ella Kyrö, Miikka Dal Maso, 2010 → ...

Co-supervision of PhD thesis: Hanna Lappalainen, Miikka Dal Maso, 05.2010 → 11.2010

PhD supervisor for Li Liao, Miikka Dal Maso, 2010

Sabine Göke ,

Supervision of doctoral thesis, Sabine Göke, 01.01.2007 → 31.12.2007, France

Kari Hartonen ,

Parameters affecting the extraction of polycyclic aromatic hydrocarbons with pressurised hot water, Kari Hartonen, 2000 → 2007, Finland

Leena Järvi ,

PhD thesis supervision, Leena Järvi, 2009 → ..., Finland

Eija Juurola ,

väitöskirjatyön osaohjaaja, Eija Juurola, 2002 → 2008

Markku Kulmala ,

PhD thesis supervision, Miikka Dal Maso, Markku Kulmala, 01.01.2004 → 17.11.2006, Finland

Supervision of doctoral thesis, Markku Kulmala, 01.01.2004 → 31.10.2008, Finland

Ph.D. thesis supervision: Juhani Damski, Markku Kulmala, 2005

Ph.D. thesis supervision: Mika Komppula, Markku Kulmala, 2005



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ATM/Kulmala

Ph.D. thesis supervision: Petteri Mönkkönen, Markku Kulmala, 2005
Ph.D. thesis supervision: Tareq Hussein, Markku Kulmala, 2005
Ph.D. thesis supervision: Ulrika Backman, Markku Kulmala, 2005
Supervision of doctoral thesis, Markku Kulmala, 01.01.2005 → 31.12.2005, Finland
Ph.D. thesis supervision: Antti Hyvärinen, Markku Kulmala, 2006
Ph.D. thesis supervision: Mia Pohjola, Markku Kulmala, 2006
Ph.D. thesis supervision: Sampo Ylätaalo, Markku Kulmala, 2006
Ph.D. thesis supervision: Tuukka Petäjä, Markku Kulmala, 2006
PhD Thesis supervision, Eija Asmi, Markku Kulmala, 2006 → 29.06.2010, Finland
PhD Thesis supervision, Marko Lallo, Markku Kulmala, 2006 → 31.03.2010, Finland
PhD thesis supervision, Erik Herrmann, Markku Kulmala, 2006 → 08.10.2010, Finland
PhD thesis supervision, Henri Vuollekoski, Markku Kulmala, 2006 → 10.12.2010, Finland
PhD thesis supervision, Mikael Ehn, Markku Kulmala, 2006 → 12.11.2010, Finland
PhD thesis supervision, Mikko Sipilä, Markku Kulmala, 2006 → 10.09.2010, Finland
PhD thesis supervision, Niku Kivekäs, Markku Kulmala, 2006 → 17.09.2010, Finland
Ph.D. thesis supervision: Anni Määttänen, Markku Kulmala, 2007
Ph.D. thesis supervision: Antti Lauri, Markku Kulmala, 2007
Ph.D. thesis supervision: Joonas Merikanto, Markku Kulmala, 2007
Ph.D. thesis supervision: Theo Kurten, Markku Kulmala, 2007
Ph.D. thesis supervision: Anca Hienola, Markku Kulmala, 2008
Ph.D. thesis supervision: Ilona Riipinen, Markku Kulmala, 2008
Ph.D. thesis supervision: Larisa Sogacheva, Markku Kulmala, 2008
Ph.D. thesis supervision: Virpi Tarvainen, Markku Kulmala, 2008
Ph.D. thesis supervision: Taina Ruuskanen, Markku Kulmala, 2009
Ph.D. thesis supervision: Tomi Raatikainen, Markku Kulmala, 2009

Lauri Laakso ,

Supervision of doctoral thesis, Lauri Laakso, 01.01.2008 → 31.12.2008, South Africa

Annikki Mäkelä-Carter ,

PhD supervision: Alekski Lehtonen, Annikki Mäkelä-Carter, 2005, Finland
PhD supervision: Anu Kantola, Annikki Mäkelä-Carter, 2008, Finland
PhD supervision: Pauliina Schiestl-Aalto, Annikki Mäkelä-Carter, 2008 → ...
PhD supervision: Sanna Härkönen, Annikki Mäkelä-Carter, 2008 → ..., Finland
PhD supervision: Robert Schneider, Annikki Mäkelä-Carter, 2009, Canada
PhD supervision: Tianjian Cao, Annikki Mäkelä-Carter, 2010, Finland

Eero Nikinmaa ,

Väitöskirjan ohjaus, Eero Nikinmaa, 2010 → ..., Finland
Väitöskirjaohjaus, Eero Nikinmaa, 2010 → ..., Finland
Väitöskirjaohjaus, Eero Nikinmaa, 2010 → ..., Finland
Väitöskirjaohjaus, Eero Nikinmaa, 2010 → ..., Finland
Väitöskirjaohjaus, Eero Nikinmaa, 2010 → ..., Finland



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ATM/Kulmala

Tuukka Petaja ,

Understanding the chemistry of atmospheric aerosol particle formation through measurements of physical properties, Tuukka Petaja, 2006 → 2010, Finland

Mari Pihlatie ,

Doctoral training/Thesis supervision, Mari Pihlatie, 2007 → ...

Doctoral training/Thesis supervision, Mari Pihlatie, 2008 → ..., Finland

Doctoral training/Thesis supervision, Mari Pihlatie, 2009 → ...

Albert Porcar-Castell ,

PhD Thesis Supervision, Albert Porcar-Castell, 15.01.2010 → ...

Jukka Pumpanen ,

PhD thesis of Liisa Kulmala, Jukka Pumpanen, 01.01.2006 → ..., Finland

PhD thesis of Terhi Rasilo, Jukka Pumpanen, 01.01.2007 → ..., Finland

PhD thesis of Hermann Aaltonen, Jukka Pumpanen, 01.01.2008 → ..., Finland

PhD thesis of Janne Korhonen, Jukka Pumpanen, 01.01.2008 → ..., Finland

Jouni Räisänen ,

Supervision of PhD work of Jussi Ylhäisi, Jouni Räisänen, 2009 → 2012, Finland

Maarit Raivonen ,

PhD thesis supervision, Maarit Raivonen, 2010 → ...

Ilona Riipinen ,

Doctoral degree of Taina Yli-Juuti, Ilona Riipinen, 2009 → ...

Hannu Savijärvi ,

Supervision of doctoral thesis 2006 (1), Hannu Savijärvi, 2006 → ...

Supervision of doctoral theses 2007 (5), Hannu Savijärvi, 2007 → ...

Supervision of doctoral thesis 2008 (1), Hannu Savijärvi, 2008 → ...

Supervision of doctoral theses 2009 (2), Hannu Savijärvi, 2009 → ...

Sanna Sorvari ,

PhD supervision: Laura Förström, Sanna Sorvari, 2001 → 2006

Hanna Vehkamäki ,

Väitöskirjatyön ohjaus, Hanna Vehkamäki, 2001 → 2007

Väitöskirjatyön ohjaus, Hanna Vehkamäki, 2001 → 2006, Finland

Väitöskirjatyön ohjaus, Hanna Vehkamäki, 2002 → 2008

Väitöskirjatyön ohjaus, Hanna Vehkamäki, 2003 → 2010, Finland

Väitöskirjatyön ohjaus, Hanna Vehkamäki, 2003 → 2007, Finland

Väitöskirjatyön ohjaus, Hanna Vehkamäki, 2005 → ..., Finland

Väitöskirjatyön ohjaus, Hanna Vehkamäki, 2005 → 2007

Väitöskirjatyön ohjaus, Hanna Vehkamäki, 2006 → 2011, Finland

Väitöskirjatyön ohjaus, Hanna Vehkamäki, 2008 → ..., Finland

Väitöskirjan ohjaus, Hanna Vehkamäki, 2010 → ...



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ATM/Kulmala

Timo Vesala ,

Doctoral Dissertation, Timo Vesala, 2005, Finland
Doctoral Dissertation, Timo Vesala, 2005, Finland
Doctoral Dissertation, Timo Vesala, 2005, Finland
Doctoral Dissertation, Timo Vesala, 2006, Finland
Doctoral Dissertation, Timo Vesala, 2007, Finland
Doctoral Dissertation, Timo Vesala, 2008, Finland
Doctoral Dissertation, Timo Vesala, 2008, Finland
Supervision of doctoral thesis, Timo Vesala, 27.05.2008 → 31.12.2008, Finland
Doctoral Dissertation, Timo Vesala, 2009, Finland
Doctoral Dissertation, Timo Vesala, 2010, Finland

Douglas Worsnop ,

PhD Co-Supervision, Mikael Ehn, Douglas Worsnop, 12.11.2010, Finland

Sergej Zilitinkevich ,

Supervision of doctoral thesis, Sergej Zilitinkevich, 01.01.2006 → 31.12.2006, United States

Prizes and awards

Almut Arneth

Guest fellowship, Almut Arneth, 2010

Miikka Dal Maso ,

FAAR award, Miikka Dal Maso, 02.09.2010

Heikki Junninen ,

Kunniainnointi Smart-SMEAR projektille operusteknologiapalkintokilpailussa, Heikki Junninen, 23.11.2007

Janne Henrik Korhonen ,

Good Teacher Award for junior teachers, Janne Henrik Korhonen, 19.12.2007, Finland

Markku Kulmala ,

Doctor of Natural Sciences, Honoris Causa, University of Stockholm, Markku Kulmala, 30.09.2005
Wilhelm Bjerknes medal, Markku Kulmala, 17.04.2007
Doctor of Philosophy (Physics), Honoris Causa, University of Tartu, Markku Kulmala, 01.12.2008
Honorary Chair, Markku Kulmala, 30.10.2008
Nominee for the 2007 Descartes prize for Transnational Collaborative Research for NCoE BACCI, Markku Kulmala, 15.04.2008
Fellow, American Geophysical Union, Markku Kulmala, 2009
Fuchs Memorial Award, Markku Kulmala, 01.09.2010

Hanna K Lappalainen

NASA Goddard Team Award - EOS_AURA OMI Team, Hanna K Lappalainen, 2005

Ivan Mammarella ,

Kipp & Zonen Award for Boundary Layer Meteorology 2007, Ivan Mammarella, 2007

Tuukka Petaja ,

Finnish Association for Aerosol Research Award, Tuukka Petaja, 02.09.2010, Finland



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Albert Porcar-Castell ,

Best Finnish PhD Thesis in the Field of Forestry 2008, Albert Porcar-Castell, 29.04.2009

Jouni Räisänen ,

Nobel Peace Prize 2007, Jouni Räisänen, 2007

Marja-Liisa Riekkola ,

2008 Magnus Ehrnrooth Prize in Chemistry, Marja-Liisa Riekkola, 2008

Ilona Riipinen ,

MSc thesis award of the Faculty of Science, University of Helsinki, Ilona Riipinen, 2005

PhD thesis award of University of Helsinki, Ilona Riipinen, 2008

Honorary title of Doctor Prima in the conferment ceremony of the Faculty of Philosophy, University of Helsinki, Ilona Riipinen, 2010

Member of the Academy Club for Young Scientists, Finnish Academy of Science and Letters, Ilona Riipinen, 2010 → 2011

Sheldon K. Friedlander award, Ilona Riipinen, 2010

The FAAR (Finnish Association for Aerosol Research) award, Ilona Riipinen, 2010

Hanna Vehkamäki ,

Magnus Ehrnrooth Foundation award 2010, Hanna Vehkamäki, 2010 → ..., Finland

Douglas Worsnop ,

Annual Harold Schiff Memorial Lecture, Canada, December 3, 2008, Douglas Worsnop, 08.12.2008, Canada

Regents Lecturer, College of Chemistry, University of California, Douglas Worsnop, 28.01.2008 → 08.02.2008, United States

Yoram Kaufman Award for Unselfish Cooperation in Research, Douglas Worsnop, 14.12.2010, United States

Editor of research journal

Almut Arneth

Biogeosciences, Almut Arneth, 2007 → ...

Global Biogeochemical Cycles, Almut Arneth, 2007 → ...

Jaana Bäck ,

Silva Fennica, Jaana Bäck, 28.06.2005 → 31.12.2005, Finland

Assisting scientific editor, Silva Fennica , Jaana Bäck, 01.01.2006 → 31.12.2007, Finland

Boreal Environment Research, Jaana Bäck, 01.01.2006 → 31.12.2006, Finland

Silva Fennica, Jaana Bäck, 01.01.2006 → 31.12.2006, Finland

Subject Editor, Boreal Environment Research, Jaana Bäck, 01.01.2006 → ..., Finland

Boreal Environment Research, Jaana Bäck, 01.01.2007 → 31.12.2007, Finland

Report Series in Aerosol Sciences, Jaana Bäck, 01.01.2007 → 31.12.2007, Finland

Silva Fennica, Jaana Bäck, 01.01.2007 → 31.12.2007, Finland

Michael Boy ,

Atmospheric Chemistry and Physics, Michael Boy, 01.01.2008 → 31.12.2008

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Kaarle Hämeri ,

Report Series in Aerosol Science, Kaarle Hämeri, 01.01.2005 → 31.12.2005, Finland

Atmospheric Chemistry and Physics, special issue, Quantification of aerosol nucleation in the European boundary layer (QUEST 2002-2004), Kaarle Hämeri, 01.01.2006 → 31.12.2006

Report Series in Aerosol Science, Kaarle Hämeri, 01.01.2006 → 31.12.2006, Finland

Atmospheric Research / Associate editor, Kaarle Hämeri, 2007 → ...

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Jan Daniel Julin ,

Report Series in Aerosol Science Proceedings of the NOSA 2006 Aerosol symposium, combined with the X Finnish National Aerosol Symposium, Finnish-Czech Aerosol Symposium and BACCI workshop, Jan Daniel Julin, 01.01.2006 → 31.12.2006, Finland

Eija Juurola ,

Tieteellinen toimittaja, Metsätieteen aikakauskirja, Eija Juurola, 01.01.2006 → 30.04.2009, Finland

Tieteellinen toimittaja, Silva Fennica, Eija Juurola, 01.01.2006 → 30.04.2009, Finland

Markku Kulmala ,

Boreal Environment Research, Markku Kulmala, 01.01.2002 → 31.12.2014, Finland

Atmospheric Chemistry and Physics, Markku Kulmala, 01.01.2004 → 31.12.2014

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Geophysical Research Letters, Markku Kulmala, 01.01.2005 → 31.12.2005

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Journal of Geochemical Exploration, Markku Kulmala, 01.01.2005 → 31.12.2005

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Quarterly Journal, Royal Meteorological Society, Markku Kulmala, 01.01.2006 → 31.12.2006
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Atmospheric Chemistry and Physics, editor, Markku Kulmala, 01.01.2007 → 31.12.2007
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Theo Christian Kurten ,

Chemical Physics Letters, Theo Christian Kurten, 01.01.2006 → 31.12.2006, United States
The Journal of Physical Chemistry, Theo Christian Kurten, 01.01.2006 → 31.12.2006, United States
Advances in Quantum Chemistry, Theo Christian Kurten, 01.01.2007 → 31.12.2007
Journal of Chemical Thermodynamics, Theo Christian Kurten, 01.01.2007 → 31.12.2007
Atmospheric Chemistry and Physics, Theo Christian Kurten, 01.01.2008 → 31.12.2008
International Journal of Molecular Sciences, Theo Christian Kurten, 01.01.2008 → 31.12.2008, Switzerland
Journal of Physical Chemistry, Theo Christian Kurten, 01.01.2008 → 31.12.2008, United States

Lauri Laakso ,

Atmospheric Chemistry and Physics, Lauri Laakso, 01.01.2005 → 31.12.2005
Atmospheric Environment, Lauri Laakso, 01.01.2005 → 31.12.2005
Atmospheric Research, Lauri Laakso, 01.01.2005 → 31.12.2005
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ENERGY - The International Journal, Lauri Laakso, 01.01.2005 → 31.12.2005
Journal of Applied Meteorology, Lauri Laakso, 01.01.2005 → 31.12.2005
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Journal of Geophysical Research, Lauri Laakso, 01.01.2008 → 31.12.2008
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Samuli Launiainen ,

Tellus B, Samuli Launiainen, 01.01.2006 → 31.12.2006, Sweden

Antti Johannes Lauri ,

Journal of Chemical Physics, Antti Johannes Lauri, 01.01.2005 → 31.12.2005, United States

Physical Review E, Antti Johannes Lauri, 01.01.2005 → 31.12.2005, United States

The Journal of Chemical Physics, Antti Johannes Lauri, 01.01.2006 → 31.12.2006, United States

Journal of Chemical Physics, Antti Johannes Lauri, 01.01.2007 → 31.12.2007, United States

Report Series in Aerosol Science, Antti Johannes Lauri, 01.01.2007 → 31.12.2007, Finland

Journal of Chemical Physics, Antti Johannes Lauri, 01.01.2008 → 31.12.2008, United States

Annikki Mäkelä-Carter ,

Tree Physiology, Annikki Mäkelä-Carter, 2006

Risto Juhani Makkonen ,

Atmospheric Chemistry and Physics, Risto Juhani Makkonen, 01.01.2008 → 31.12.2008

Journal of Geophysical Research - Atmospheres, Risto Juhani Makkonen, 01.01.2008 → 31.12.2008

Ivan Mammarella ,

Boundary-Layer Meteorology, Ivan Mammarella, 01.01.2006 → 31.12.2006

Ismo Ilmari Napari ,

Geophysical Research Letters, Ismo Ilmari Napari, 01.01.2005 → 31.12.2005

Journal of Chemical Physics, Ismo Ilmari Napari, 01.01.2005 → 31.12.2005

Journal of Geophysical Research, Ismo Ilmari Napari, 01.01.2005 → 31.12.2005

Physical Review E, Ismo Ilmari Napari, 01.01.2005 → 31.12.2005

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Physical Review E, Ismo Ilmari Napari, 01.01.2006 → 31.12.2006

Journal of Chemical Physics, Ismo Ilmari Napari, 01.01.2007 → 31.12.2007

Eero Nikinmaa ,

Canadian Journal of Botany, Eero Nikinmaa, 01.01.2006 → 31.12.2006, Canada

Plant, Cell & Environment, Eero Nikinmaa, 01.01.2006 → 31.12.2006, United Kingdom

Silva Fennica, Eero Nikinmaa, 01.01.2006 → 31.12.2006, Finland

Tellus, Eero Nikinmaa, 01.01.2006 → 31.12.2006, Sweden

Tree Physiology, Eero Nikinmaa, 01.01.2006 → 31.12.2006, Canada

Trees, Eero Nikinmaa, 01.01.2006 → 31.12.2006, Germany

Tuukka Petaja ,

Report Series in Aerosol Science, Vol 80, Tuukka Petaja, 01.01.2006 → 31.12.2006, Finland

Mari Pihlatie ,

Global Change Biology, Mari Pihlatie, 01.01.2005 → 31.12.2005

Scandinavian Journal of Forest Research, Mari Pihlatie, 01.01.2005 → 31.12.2005, Sweden

Tellus B, Mari Pihlatie, 01.01.2006 → 31.12.2006, Sweden

New Phytologist, Mari Pihlatie, 01.01.2008 → 31.12.2008, United Kingdom

Plant and Soil, Mari Pihlatie, 01.01.2008 → 31.12.2008, Netherlands



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Jukka Pumpanen ,

Annals of Forest Science, Jukka Pumpanen, 21.06.2005 → 31.12.2005, France
Canadian Journal of Forest Research, Jukka Pumpanen, 30.06.2005 → 31.12.2005, Canada
Global Change Biology, Jukka Pumpanen, 04.05.2005 → 31.12.2005, United Kingdom
Boreal Environment Research, Jukka Pumpanen, 01.01.2006 → 31.12.2006, Finland
Agricultural and Forest Meteorology, Jukka Pumpanen, 26.07.2007 → 31.12.2007, United Kingdom
Biogeosciences, Jukka Pumpanen, 11.06.2007 → 31.12.2007, Germany
Global Change Biology, Jukka Pumpanen, 01.01.2007 → 31.12.2007, United Kingdom
Plant and Soil, Jukka Pumpanen, 28.08.2007 → 31.12.2007, Netherlands
Metsätieteen aikakauskirja, Jukka Pumpanen, 01.01.2008 → 31.12.2010, Finland
Silva Fennica, Jukka Pumpanen, 01.01.2008 → 31.12.2010, Finland

Jouni Räisänen ,

Tellus A, member of editorial board, Jouni Räisänen, 2006 → ..., Sweden
IPCC Technical Paper on Climate Change and Water, member of the principal author group, Jouni Räisänen, 01.01.2007 → 31.12.2007
The Impact of Climate Change on European Lakes, Jouni Räisänen, 01.01.2007 → 31.12.2007
Geophysica, member of editorial board, Jouni Räisänen, 2008 → ..., Finland

Maarit Raivonen ,

Tellus Series B: Chemical and Physical Meteorology, Maarit Raivonen, 01.01.2006 → 31.12.2006
Oecologia, Maarit Raivonen, 01.01.2008 → 31.12.2008

Anni Reissell ,

Integrated Land Ecosystem - Atmosphere Processes Study, Proc. of the 1st iLEAPS Science Conference, Boulder, Colorado, USA, Report Series in Aerosol Science No 79, Anni Reissell, 01.01.2006 → 31.12.2006
iLEAPS Newsletter, Anni Reissell, 01.01.2007 → 31.12.2007

Marja-Liisa Riekkola ,

Member of Editorial Board of Journal of Biochemical and Biophysical Methods, Marja-Liisa Riekkola, 1998 → 2008, Netherlands
Member of Advisory editorial board of Chromatographia, Marja-Liisa Riekkola, 01.01.1999 → ..., Germany
Member of Advisory editorial board of Electrophoresis, Marja-Liisa Riekkola, 01.01.1999 → ..., Germany
Member of Advisory editorial board of J. Chromatographic Science, Marja-Liisa Riekkola, 01.01.2000 → ..., United States
Member of Advisory editorial board of Journal of Analytical and Bioanalytical Chemistry, Marja-Liisa Riekkola, 2002 → 2009, Germany
Member of Advisory editorial board of Journal of Separation Science, Marja-Liisa Riekkola, 01.01.2002 → ..., Germany
Member of Advisory editorial board of the Analyst, Marja-Liisa Riekkola, 2004 → 2008, United Kingdom
Analytical Chimica Acta, Marja-Liisa Riekkola, 01.01.2005 → 31.12.2005
Atmospheric Research, Marja-Liisa Riekkola, 01.01.2005 → 31.12.2005
Chromatographia, Marja-Liisa Riekkola, 01.01.2005 → 31.12.2005
Editor of Journal of Chromatography A, Marja-Liisa Riekkola, 01.01.2005 → ..., Netherlands
Electrophoresis, Marja-Liisa Riekkola, 01.01.2005 → 31.12.2005
Industrial and Engineering Chemistry Research, Marja-Liisa Riekkola, 01.01.2005 → 31.12.2005
J. American Chemical Society, Marja-Liisa Riekkola, 01.01.2005 → 31.12.2005
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Journal of the American Society for Mass Spectrometry, Marja-Liisa Riekkola, 01.01.2005 → 31.12.2005
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Journal of Biochemical and Biophysical Methods (Elsevier), Marja-Liisa Riekkola, 01.01.2008 → 31.12.2008

Ilona Riipinen ,

Atmospheric Chemistry and Physics, Ilona Riipinen, 01.01.2006 → 31.12.2006
Chemical Physics Letters, Ilona Riipinen, 01.01.2006 → 31.12.2006
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Boundary-Layer Meteorology, Janne Rinne, 01.01.2005 → 31.12.2005
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iLEAPS Newsletter, issue no 3, Sanna Sorvari, 12.2006
iLEAPS Newsletter, special issue on Biomass Burning, issue no 4, Sanna Sorvari, 06.2007
iLEAPS Newsletter, special issue on Aerosols-clouds-Precipitation-Climate, issue no 5, Sanna Sorvari, 01.01.2008 → 31.12.2008

Editor of series

Markku Kulmala ,

Report Series in Aerosol Science, Markku Kulmala, 01.01.1986 → 31.12.2014

Hanna Vehkamäki ,

Vieraileva toimittaja, Boreal Environment Research, Hanna Vehkamäki, 2007 → ..., Finland

Editor of special theme number

Annikki Mäkelä-Carter ,

Guest editor of Tree Physiology 25(7), 2005: Modeling Forest Production, Annikki Mäkelä-Carter, 2005



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Assessment of candidates for academic posts

Kaarle Hämeri ,

Evaluation for Professorship, Kaarle Hämeri, 2010 → ..., Sweden

Evaluation for Professorship for Stockholm University, Kaarle Hämeri, 2010, Sweden

Examiner / Dosentship / Mika Komppula, Kaarle Hämeri, 2010, Finland

University lecturers / member in expert committees, Kaarle Hämeri, 2010, Finland

Markku Kulmala ,

Professor in Physics, Markku Kulmala, 10.03.2010 → 14.03.2010, Ireland

Annikki Mäkelä-Carter ,

External evaluator: Chair in silviculture, SLU, Annikki Mäkelä-Carter, 2009, Sweden

Marja-Liisa Riekkola ,

Evaluator of Candidates for Professor in Analytical Chemistry at Göteborg University, Marja-Liisa Riekkola, 31.01.2007, Sweden

Candidate assessment for professor in analytical chemistry, Oslo University, Marja-Liisa Riekkola, 2010 → ..., Norway

Candidate assessment for professor in separation technologies and bioanalytics, University of Vienna, Marja-Liisa Riekkola, 13.09.2010, Austria

Promotion to Assistant Professor, University of Cyprus, Marja-Liisa Riekkola, 08.10.2010, Cyprus

Research Evaluation for Development of Research at the University of Gothenburg, Sweden, Marja-Liisa Riekkola, 2010 → ..., Sweden

Senior Research Position in Analytical chemistry for a sustainable development, Swedish Research Council, Sweden, Marja-Liisa Riekkola, 2010 → ..., Sweden

Hannu Savijärvi ,

Arvioija, MISU:n apul.prof./senior lecturer post, Hannu Savijärvi, 2010 → ..., Sweden

Hanna Vehkamäki ,

Dosentihakemuksen arvioija, Hanna Vehkamäki, 2010, Finland

Membership or other role in review committee

Jaana Bäck ,

member in grant panel, Jaana Bäck, 2009

Member in grant panel, Jaana Bäck, 2010, Finland

Annikki Mäkelä-Carter ,

Member of the nominations board for the professorships on horticulture, Annikki Mäkelä-Carter, 2005, Finland

Member of the nominations board for the professorships on forest pathology, Annikki Mäkelä-Carter, 2006, Finland

Chair of the nominations board for the professorships on forest soil science, Annikki Mäkelä-Carter, 2009, Finland

Chair of the nominations board for the professorships on tropical silviculture, Annikki Mäkelä-Carter, 2009, Finland

Member of Panel 8 (Forest management and products) of the Quality and Impact Assessment of SLU, Annikki Mäkelä-Carter, 2009, Sweden

Chair of evaluations board of the MIL research programme, Metla, Annikki Mäkelä-Carter, 2010, Finland

Member of the nominations board for the professorships on geoinformatics, Annikki Mäkelä-Carter, 2010 → 2011, Finland

Jouni Räisänen ,

Reviewer of EU FP6 ENSEMBLES project, Jouni Räisänen, 2005 → 2007

Membership in Review committee for United States National Science Foundation, Jouni Räisänen, 2006 → ..., United States



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Membership in Review panel of Research Council of Norway, Jouni Räisänen, 2006 → ..., Norway

Membership in Review Panel, Czech Academy of Sciences, Jouni Räisänen, 2007, Czech Republic

Membership in review panel, NWO, Jouni Räisänen, 2007, Netherlands

Membership in review panel, French Academy of Sciences, Jouni Räisänen, 2008, France

Membership in review panel, NWO, Jouni Räisänen, 2009, Netherlands

Marja-Liisa Riekkola ,

Member of the Evaluation Board, Marja-Liisa Riekkola, 2000 → 2006, Finland

Member of Evaluation Panel of the Komppa Chemistry Doctoral Thesis Award, Marja-Liisa Riekkola, 2004 → ..., Finland

Chairperson of Assessment Panel of the Strategic Plans of CSIC for 2005-2009, Marja-Liisa Riekkola, 22.09.2005 → 24.09.2005, Spain

Member of Evaluation Panel for Natural and Engineering Science Applications in Organic, Inorganic and Analytical Chemistry, Marja-Liisa Riekkola, 18.09.2006 → 19.09.2006, Sweden

Member of COST Evaluation Panel of Chemistry and Molecular Sciences and Technologies (CMST), Marja-Liisa Riekkola, 20.08.2007 → 21.08.2007, Belgium

Member of Evaluation Panel of Chemistry at Uppsala University KoF 07 (Quality and Renewal 2007), Marja-Liisa Riekkola, 26.03.2007 → 30.03.2007, Sweden

Finnish-German Research Training cooperation/Joint Call of Deutsche Forschungsgemeinschaft, Marja-Liisa Riekkola, 03.2009, Finland

The Aalto University Research Assessment Exercise 2009, Marja-Liisa Riekkola, 07.06.2009 → 12.06.2009, Finland

Timo Vesala ,

Review committee member, Timo Vesala, 08.2010 → 01.2011, Finland

Membership or other role in research network

Almut Arneth

Scientific Steering Committee, Almut Arneth, 2004 → ...

Scientific Steering Committee, Almut Arneth, 08.2006 → 09.2009

member, Almut Arneth, 2008 → ...

Member of Expert Group, Almut Arneth, 2009 → ...

Vice-Chair, Almut Arneth, 2009 → ...

Working group leader, Almut Arneth, 2009 → ...

Jaana Bäck ,

BACCI (Biosphere-Atmosphere-Cloud-Climate Interactions) Nordic CoE, Jaana Bäck, 2005 → 2009

Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change, Jaana Bäck, 2007 → 2010

Nordic-Baltic BACCI, Jaana Bäck, 2009 → ...

CRYOSPHERE-ATMOSPHERE INTERACTIONS IN A CHANGING ARCTIC CLIMATE (CRAICC), Jaana Bäck, 2010 → ...

Markku Kulmala ,

CBACCI, coordinator, Markku Kulmala, 2003 → 2013

EUSAAR, steering committee, Markku Kulmala, 2006 → 2011

Megacity, steering committee, Markku Kulmala, 2009 → 2013

CRAICC, coordinator, Markku Kulmala, 2010 → 2015

Katrianne Lehtipalo ,

Aerosolittutkimusseuran sihteeriys, Katrianne Lehtipalo, 01.08.2009 → 31.12.2010, Finland



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Annikki Mäkelä-Carter ,

Chair of IUFGRO working party, Annikki Mäkelä-Carter, 1995 → 2005

COST Action FP0603, member of management committee and steering committee, Annikki Mäkelä-Carter, 2008 → 2011

COST Action FP0763, management committee member, Annikki Mäkelä-Carter, 2008 → 2011

Nordic network on climate and biodiversity - membership, Annikki Mäkelä-Carter, 2010 → ...

Eero Nikinmaa ,

Functional structural plant models scientific board, Eero Nikinmaa, 1997 → 2013

Siegfried Schobesberger ,

CLOUD Initial Training Network, Siegfried Schobesberger, 01.09.2009 → 31.07.2012, Germany

Sanna Sorvari ,

Project: MUTUAL - Multiproxy approach to estimate changes in UV exposure in Arctic lakes,, Sanna Sorvari, 01.01.2004 → 31.12.2006, Finland

Project: Science workshop on past, present and future climate change, funded by Finnish Cultural Foundation, member of the project committee, Sanna Sorvari, 01.01.2007 → 31.12.2008

Helsinki Insight - Fundraising campaign, coordinator of theme Climate Change, Sanna Sorvari, 01.01.2008 → ..., Finland

Project: ILMA - Ilmakehätieteen kehittämishanke, Sanna Sorvari, 01.09.2008 → ...

Project: New opportunities for Finnish-Japanese cooperation in urban land-atmosphere and air quality research, Finnish-Japanese bilateral collaboration, Sanna Sorvari, 01.01.2008 → 31.12.2008

Assessing Nordic climate change research (NordForsk Policy Brief 2009-8 on Climate Change Research, Sanna Sorvari, 01.06.2009 → 30.06.2009

Environmental Science panel for assessing Finnish research (SIGHT – The State and quality of scientific research in Finland 2009), Sanna Sorvari, 01.05.2009 → 31.05.2009

Project: EIT-EINAR European Institute for Innovation and Technology, Sanna Sorvari, 01.01.2009 → 31.12.2009

Member of Ympäristötiedon Foorumi, Sanna Sorvari, 01.07.2010 → 31.12.2011

Project: ICOS – Integrated Carbon Observation System, Sanna Sorvari, 01.01.2010 → 31.12.2011

Timo Vesala ,

Member, Timo Vesala, 2010 → ..., United States

Membership or other role in national/international committee, council, board

Almut Arneth

Advisory Board Member, Almut Arneth, 2004 → ...

Ari Asmi ,

Finnish Association for Aerosol Research FAAR - Aerosolitutkimusseura ry, treasurer, Ari Asmi, 01.01.2005 → 31.12.2005, Finland

Finnish Association for Aerosol Research FAAR - Aerosolitutkimusseura ry, treasurer, Ari Asmi, 01.01.2006 → 31.12.2006, Finland

Jaana Bäck ,

Greenhouse gases and aerosols: Interactions between northern ecosystems and climate, International conference given by the NECC and BACCI Nordic Centres of Excellence, Reykjavik, Iceland, June 16 18, 2008, member of the organizing committee, Jaana Bäck, 01.01.2008 → 31.12.2008

Michael Boy ,

1st iLEAPS Science Conference 21 - 26 January 2006, Boulder, CO, member of the local Organizing committee, Michael Boy, 01.01.2006 → 31.12.2006

Workshop on Biogenic Secondary Organic Aerosols: Observations to Global Modeling, member of the organizing committee, Michael Boy, 01.01.2007 → 31.12.2007, Finland



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Miikka Dal Maso ,

Vice member of the Board of the Finnish Association of Aerosol Research, Miikka Dal Maso, 2010 → ..., Finland

Mikael Kristian Ehn ,

De Finlandssvenska Fysikdagarna, 20.-22.10.2007, M/S Silja Serenade, member of the organizing committee for a conference for physics teachers, Mikael Kristian Ehn, 01.01.2007 → 31.12.2007, Finland

Kaarle Hämeri ,

Chairman / TSI-Fissan-Pui award committee, Kaarle Hämeri, 2004 → ...

Finnish Association for Aerosol Research FAAR - Aerosolitutkimusseura ry, vice chairman, Kaarle Hämeri, 01.01.2005 → 31.12.2005, Finland

Nanotechnology in Northern Europe, Congress and Exhibition 26.-28.4.2005, Helsinki, Fair Centre, member of the Organizing Committee for the section Nanotechnology and Environment, Kaarle Hämeri, 01.01.2005 → 31.12.2005

The American Association for Aerosol Research AAAR, Kaarle Hämeri, 01.01.2005 → 31.12.2005, United States

Finnish Association for Aerosol Research FAAR - Aerosolitutkimusseura ry, vice chairman, Kaarle Hämeri, 01.01.2006 → 31.12.2006, Finland

Nanotechnology in Northern Europe Conference in Helsinki 16.-18.5.2006, member of the Scientific Committee, Kaarle Hämeri, 02.02.2006 → 31.12.2006, Finland

Physics Days 2007, Tallinn 15.-17.3.2007, organizing committee, Kaarle Hämeri, 01.01.2006 → 31.12.2006, Finland

Seminaari "Hyvät, pahat ja rumat pienhiukkaset", Ilmatieteen laitos 8.11.2006, järjestäjä, Kaarle Hämeri, 01.01.2006 → 31.12.2006, Finland

The American Association for Aerosol Research AAAR, Kaarle Hämeri, 01.01.2006 → 31.12.2006, United States

Board member of Fine particle forum / Hiukkasfoorumi, Kaarle Hämeri, 2007 → ..., Finland

Finnish Association for Aerosol Research FAAR, Kaarle Hämeri, 01.01.2007 → 31.12.2007, Finland

Physics Days 2007, Tallinn 15.-17.3.2007, organizing committee, Kaarle Hämeri, 01.01.2007 → 31.12.2007, Finland

2010 International Aerosol Conference, Helsinki, conference co-chairman, Kaarle Hämeri, 01.01.2008 → 31.12.2008

Finnish Association for Aerosol Research FAAR, Kaarle Hämeri, 01.01.2008 → 31.12.2008, Finland

Formas Forskningsrådet för miljö, areella näringar och samhällsbyggande, Kaarle Hämeri, 01.01.2008 → 31.12.2008, Sweden

International Aerosol Research Assembly, vice chairman, Kaarle Hämeri, 01.01.2008 → 31.12.2008

Member of steering group of Uudenmaan Nano-oske, Kaarle Hämeri, 2008 → ..., Finland

Kari Hartonen ,

Chromatographic division, Kari Hartonen, 1991 → ..., Finland

Mass Spectrometry division, Kari Hartonen, 2004 → ..., Finland

Compressed fluid technologies division, Kari Hartonen, 2005 → 2011, Finland

Suomen Kemian Seuran Ylikriittiset fluiditeknikat -jaosto, Kari Hartonen, 01.01.2005 → 31.12.2005

Leena Järvi ,

10th Anniversary of Hyytiälä EUROFLUX workshop 10.-12.12.2008, member of the organizing committee, Leena Järvi, 01.01.2008 → 31.12.2008, Finland

Finnish Centre of Excellence in Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change, Leena Järvi, 2008 → 2013, Finland

New opportunities for Finnish-Japanese cooperation in urban land-atmosphere and air quality research, seminar held in Kumpula 24.-25.11.2008, member of the organizing committee, Leena Järvi, 01.01.2008 → 31.12.2008, Finland

American Meteorological Society, Leena Järvi, 2010 → ..., United States

Eija Juurola ,

Suomen metsätieteellisen seuran sihteeri, Eija Juurola, 01.01.2006 → ..., Finland



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ATM/Kulmala

Markku Kulmala ,

Gesellschaft für Aerosolforschung, Markku Kulmala, 1984 → ..., Germany
The American Association for Aerosol Research, Markku Kulmala, 1985 → ..., United States
The European Geophysical Union, Markku Kulmala, 1999 → ...
Committee on Nucleation and Atmospheric Aerosols, honorary chair, Markku Kulmala, 2004 → ...
Coordinator of NorFA Graduate School, CBACCI, Markku Kulmala, 01.01.2005 → 31.12.2005
Coordinator of Nordic Centre of Excellence BACCI, Markku Kulmala, 01.01.2005 → 31.12.2005
Finnish Association for Aerosol Research FAAR, member of the board, Markku Kulmala, 01.01.2005 → 31.12.2005, Finland
Member of the Committee on Nucleation and Atmospheric Aerosols (CNAA), Markku Kulmala, 01.01.2005 → 31.12.2005
Vice-Chair of Scientific Steering Committee of iLEAPS, Markku Kulmala, 01.01.2005 → 31.12.2005
1st iLEAPS Science Conference, Boulder, CO, USA, 21-26 Jan 2006, member of the Scientific Committee, Markku Kulmala, 01.01.2006 → 31.12.2006
Finnish Association for Aerosol Research FAAR, member of the board, Markku Kulmala, 01.01.2006 → 31.12.2006, Finland
NorFA Graduate School CBACCI, coordinator, Markku Kulmala, 01.01.2006 → 31.12.2006
Nordic Center of Excellence, Research Unit of Biosphere - Aerosol - Cloud - Climate Interactions (BACCI), coordinator, Markku Kulmala, 01.01.2006 → 31.12.2006
Vice-Chair of Scientific Steering Committee of iLEAPS, Markku Kulmala, 01.01.2006 → 31.12.2006
EUCAARI 1st Annual Review, Helsinki 20.-23.11.2007, chairman of the organizing committee, Markku Kulmala, 01.01.2007 → 31.12.2007, Finland
EUCAARI coordinator, Markku Kulmala, 01.01.2007 → 31.12.2010, Finland
Finnish Association for Aerosol Research FAAR, member of the board, Markku Kulmala, 01.01.2007 → 31.12.2007, Finland
Nordic Centre of Excellence, Markku Kulmala, 01.01.2007 → 31.12.2007
Workshop on Biogenic Secondary Organic Aerosols: Observations to Global Modeling, member of the organizing committee, Markku Kulmala, 01.01.2007 → 31.12.2007, Finland
iLEAPS Scientific Steering Committee, Markku Kulmala, 01.01.2007 → 31.12.2007
2010 International Aerosol Conference, Helsinki, conference co-chairman, Markku Kulmala, 01.01.2008 → 31.12.2008
European Aerosol Conference 24-29 August 2008, Thessaloniki, Greece, member of the scientific committee, Markku Kulmala, 01.01.2008 → 31.12.2008
FAAR, honorary chair, Markku Kulmala, 2008 → ...
Finnish Association for Aerosol Research FAAR, Markku Kulmala, 01.01.2008 → 31.12.2008, Finland
Greenhouse gases and aerosols: Interactions between northern ecosystems and climate, International conference given by the NECC and BACCI Nordic Centres of Excellence, Reykjavik, Iceland, June 16 18, 2008, member of the scientific committee, Markku Kulmala, 01.01.2008 → 31.12.2008
New opportunities for Finnish-Japanese cooperation in urban land-atmosphere and air quality research, seminar held in Kumpula 24.-25.11.2008, member of the scientific committee, Markku Kulmala, 01.01.2008 → 31.12.2008, Finland
iLEAPS Scientific Steering committee, Markku Kulmala, 01.01.2008 → 31.12.2008
American Geophysical Union, fellow, Markku Kulmala, 2009 → ..., United States
Chair / iLEAPS, Markku Kulmala, 01.01.2010 → 31.12.2012

Lauri Laakso ,

APSA steering group, Lauri Laakso, 01.01.2007 → 31.12.2007
POLARCAT steering group, Lauri Laakso, 01.01.2007 → 31.12.2007

Antti Johannes Lauri ,

Matemaattis-luonnontieteellisten alojen Akateemiset ry, Antti Johannes Lauri, 01.01.2005 → ..., Finland
The 1st European Conference on Science, Art and Technology in the Service of Man, 7.-9.9.2006, University of Helsinki, chairman of the programme committee, Antti Johannes Lauri, 01.01.2006 → 31.12.2006, Finland



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Finnish Association for Aerosol Research FAAR - Suomen Aerosolitutkimusseura, treasurer, Antti Johannes Lauri, 01.01.2007 → 31.12.2007, Finland

Finnish Association for Aerosol Research FAAR, treasurer, Antti Johannes Lauri, 01.01.2008 → 31.12.2008, Finland

Aerosolitutkimusseura, Antti Johannes Lauri, 01.01.2009 → ..., Finland

MATIAS, Antti Johannes Lauri, 01.01.2010 → ..., Finland

Annikki Mäkelä-Carter ,

Finnish Society of Forest Science: member of governing board, Annikki Mäkelä-Carter, 2002 → 2005, Finland

Member of the Finnish Academy of Science and Letters, Annikki Mäkelä-Carter, 2004 → ..., Finland

Chair of the steering group for Värriö research station, Annikki Mäkelä-Carter, 2005 → 2009, Finland

Vice-member of the smaller faculty council (suppea tdk-neuvosto), Annikki Mäkelä-Carter, 2007 → 2009, Finland

Member of the smaller faculty council (suppea tdk-neuvosto), Annikki Mäkelä-Carter, 04.2009 → 12.2009, Finland

Eero Nikinmaa ,

Hallituksen jäsen, Eero Nikinmaa, 01.05.2006 → 31.12.2010, Finland

Suomen Metsätieteellinen Seura, Eero Nikinmaa, 01.01.2006 → 31.12.2006, Finland

Mari Pihlatie ,

NORFRETETE team, Mari Pihlatie, 01.01.2005 → 31.12.2005

Jukka Pumpanen ,

NWO Innovation Research Incentive Scheme, Jukka Pumpanen, 24.08.2007 → 31.12.2007, Netherlands

Jouni Räisänen ,

Lead Author in Intergovernmental Panel on Climate Change, Jouni Räisänen, 2004 → 2007

Intergovernmental Panel on Climate Change, Author of the Fourth Climate Change Report and Referee of the Preliminary Versions of the Report, Jouni Räisänen, 01.01.2006 → 31.12.2006

Anni Reissell ,

iLEAPS International Research Project, Anni Reissell, 01.03.2004 → 31.12.2014

IGBP IPO, Anni Reissell, 01.01.2005 → 31.12.2005

iLEAPS Executive Committee, Anni Reissell, 01.01.2005 → 31.12.2005

1st iLEAPS Science Conference, Boulder, CO, USA, 21-26 Jan 2006, member of the Scientific Committee, Anni Reissell, 01.01.2006 → 31.12.2006

IGBP IPO, Anni Reissell, 01.01.2006 → 31.12.2006

Opetusministeriön työryhmän jäsen, Anni Reissell, 31.10.2006 → 05.03.2007, Finland

iLEAPS Executive Committee, Anni Reissell, 01.01.2006 → 31.12.2006

ESA/AMES Workshop "Coupling Earth System Models and Observations for Northern High Latitudes", Frascati 10.-11.9.2007, member of the organising committee, Anni Reissell, 01.01.2007 → 31.12.2007

IGBP IPO, Anni Reissell, 01.01.2007 → 31.12.2007

Monsoon Asia Integrated Regional Study (MAIRS), member of the scientific committee, Anni Reissell, 01.01.2008 → 31.12.2008

New opportunities for Finnish-Japanese cooperation in urban land-atmosphere and air quality research, seminar held in Kumpula 24.-25.11.2008, member of the organizing committee, Anni Reissell, 01.01.2008 → 31.12.2008, Finland

COST Action DC ESSEM External Expert Panel meeting, Anni Reissell, 02.09.2010 → 03.09.2010, Belgium

COST ESSEM Domain Committee, Domain External Expert, Anni Reissell, 01.06.2010 → 31.05.2014, Belgium

COST Trans-Domain Proposals (TDP FI) Domain Expert, Anni Reissell, 09.2010 → 10.2010, Belgium



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Marja-Liisa Riekkola ,

Member and Vice-Chairman (2007-2008) of Board of Directors, Marja-Liisa Riekkola, 2001 → 2008, Finland

Member of Board of Directors, Marja-Liisa Riekkola, 2001 → 2006, Finland

Kansallinen nanotieteiden tutkijakoulu (NGS-NANO), Marja-Liisa Riekkola, 01.01.2005 → 31.12.2005

Luonnon-, bio- ja ympäristötieteiden neuvottelukunta, Marja-Liisa Riekkola, 01.01.2005 → 31.12.2005

Maj ja Tor Nesslingin säätiö, Marja-Liisa Riekkola, 01.01.2005 → 31.12.2005

Member of Nanoscience Development Committee of Ministry of Education, Marja-Liisa Riekkola, 2005, Finland

Scientific Advisory Board of Kumpula Campus, Marja-Liisa Riekkola, 01.01.2005 → 31.12.2005

Board Member of Chemical Sensors and Microsystems Graduate School (CHEMSEM), Marja-Liisa Riekkola, 01.01.2006 → ..., Finland

Kansallisen nanotieteen (NGS-NANO) tutkijakoulun, Marja-Liisa Riekkola, 01.01.2006 → 31.12.2006, Finland

Member of Evaluation Panel for Natural and Engineering Science Applications in Organic, Inorganic and Analytical Chemistry, Swedish Research Council, Marja-Liisa Riekkola, 01.01.2006 → 31.12.2006

Ilona Riipinen ,

Academy of Sciences of the Czech Republic, Ilona Riipinen, 01.01.2008 → 31.12.2008, Czech Republic

National Oceanic and Atmospheric Administration (NOAA), Ilona Riipinen, 01.01.2008 → 31.12.2008, United States

Invited expert in European Research Area Board, Ilona Riipinen, 2009

Janne Rinne ,

EGU General Assembly, 24.-29.4.2005, Wien, session convener, Janne Rinne, 01.01.2005 → 31.12.2005, Austria

European Geophysical Union, Janne Rinne, 01.01.2007 → 31.12.2007

Federaal Wetenschapsbeleid (BELSPO), Janne Rinne, 01.01.2007 → 31.12.2007, Belgium

Taina Ruuskanen ,

ACCENT OVOC Intercomparison PTR-MS measurements project, person in charge, Taina Ruuskanen, 01.01.2005 → 31.12.2005

Nordic Center of Excellence, Research Unit on Biosphere - Aerosol - Cloud - Climate Interactions (BACCI), Taina Ruuskanen, 01.01.2005 → 31.12.2005

Nordic Graduate School CBACCI, Taina Ruuskanen, 01.01.2005 → 31.12.2005

iLEAPS 2011 Science Conference ECSW organizing committee member, Taina Ruuskanen, 01.10.2010 → 18.09.2011

Hannu Savijärvi ,

European Centre for Medium-Range Weather Forecasts ECMWF, Scientific Advisory Committee, Hannu Savijärvi, 04.06.2005 → 14.06.2005

MEXC-NetFAM summer school "Flow over complex surface" in Sodankylä observatory, member of the organizing committee, Hannu Savijärvi, 01.01.2005 → 31.12.2005, Finland

Suomen Akatemian Climatic Extremes-projektin johtoryhmä, Hannu Savijärvi, 01.01.2005 → 31.12.2005, Finland

American Astronomical Society, Hannu Savijärvi, 01.01.2006 → 31.12.2006, United States

American Geophysical Union, Hannu Savijärvi, 01.01.2006 → 31.12.2006, United States

European Geophysical Society, Hannu Savijärvi, 01.01.2006 → 31.12.2006

Geofysiikan seura, Hannu Savijärvi, 01.01.2006 → 31.12.2006

Summer School on Air-sea Interaction, Helsinki, 28.8.-1.9.2006, member of the organizing committee, Hannu Savijärvi, 01.01.2006 → 31.12.2006, Finland

Suomalainen Tiedeakatemia, Hannu Savijärvi, 01.01.2006 → 31.12.2006

Sanna Sorvari ,

International Diatom Society, Sanna Sorvari, 2000 → 2006

Finnish Limnology Society, Sanna Sorvari, 2003 → 2006



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ATM/Kulmala

Geophysical Society of Finland, Sanna Sorvari, 2007 → ...

European Geoscience Union, Sanna Sorvari, 2008 → ...

JPI CliK'EU Interim Executive Board member, Sanna Sorvari, 01.01.2010 → 31.12.2010

Member of ICOS-Finland Stakeholder Board, Sanna Sorvari, 01.01.2010 → 31.12.2010

Member of Nordic Centre of Excellence CRAICC - Cryosphere-Atmosphere Interactions in a Changing Arctic Climate, Sanna Sorvari, 01.11.2010 → 30.10.2013

Tanja Suni ,

Finnish Association for Aerosol Research FAAR, Tanja Suni, 01.01.2008 → 31.12.2008, Finland

Hanna Vehkamäki ,

NOSA johtokunnan jäsen, Hanna Vehkamäki, 2003 → ...

European Aerosol Assemblyn jäsen, Hanna Vehkamäki, 2004 → ...

Junge- palkintolautakunnan jäsen, Hanna Vehkamäki, 2004 → ...

Nucleation and atmospheric aerosols komitean jäsen, Hanna Vehkamäki, 2004 → 2009

Board member of Nordic Society for Aerosol Research (NOSA), Hanna Vehkamäki, 01.01.2005 → 31.12.2005

European Aerosol Assembly, General Secretary, Hanna Vehkamäki, 01.01.2005 → 31.12.2005, Finland

Finnish Association for Aerosol Research FAAR - Suomen Aerosolitutkimusseura, deputy member of the board, Hanna Vehkamäki, 01.01.2005 → 31.12.2005, Finland

Member of the International Conference for Nucleation and Atmospheric Aerosols commission, Hanna Vehkamäki, 01.01.2005 → 31.12.2005

Representative of NOSA in European Aerosol Assembly (EAA), Hanna Vehkamäki, 01.01.2005 → 31.12.2005

Representative of NOSA in Junge prize committee, Hanna Vehkamäki, 01.01.2005 → 31.12.2005

Board member of Nordic Society for Aerosol Research (NOSA), Hanna Vehkamäki, 01.01.2006 → 31.12.2006

European Aerosol Assembly, General Secretary, Hanna Vehkamäki, 01.01.2006 → 31.12.2006

Finnish Association for Aerosol Research FAAR - Suomen Aerosolitutkimusseura, deputy member of the board, Hanna Vehkamäki, 01.01.2006 → 31.12.2006, Finland

International Conference for Nucleation and Atmospheric Aerosols commission, member, Hanna Vehkamäki, 01.01.2006 → 31.12.2006

Junge prize committee, representative of NOSA, Hanna Vehkamäki, 01.01.2006 → 31.12.2006

Finnish Association for Aerosol Research FAAR - Suomen Aerosolitutkimusseura, deputy member of the board, Hanna Vehkamäki, 01.01.2007 → 31.12.2007, Finland

Nordic Society for Aerosol Research, Hanna Vehkamäki, 01.01.2007 → 31.12.2007

Committee on Nucleation and Atmospheric Aerosols, Hanna Vehkamäki, 01.01.2008 → 31.12.2008

Finnish Association for Aerosol Research FAAR - Suomen Aerosolitutkimusseura, vice chairman of the board, Hanna Vehkamäki, 01.01.2008 → 31.12.2008, Finland

Finnish/Nordic representative in the European Aerosol Assembly (EAA), Hanna Vehkamäki, 01.01.2008 → 31.12.2008

NOSA Aerosol Symposium 2008, Oslo, 6.-7.11.2008, member of the organizing committee, Hanna Vehkamäki, 01.01.2008 → 31.12.2008, Norway

NOSA representative in the Junge Award committee, Hanna Vehkamäki, 01.01.2008 → 31.12.2008

Nordic Society for Aerosol Research, Hanna Vehkamäki, 01.01.2008 → 31.12.2008

Suomen aerosolitutkimusseuran varapuheenjohtaja, Hanna Vehkamäki, 2008 → ..., Finland

Timo Vesala ,

Grant Agency Academy of Sciences of the Czech Republic, Timo Vesala, 01.01.2005 → 31.12.2005, Czech Republic

Physics Days 2007 (41. Annual Meeting of the Finnish Physical Society), Tallinn 15.-17.3.2007, program committee, Timo Vesala, 01.01.2006 → 31.12.2006, Finland



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IMECC workshop for CO₂ flux measurement techniques, chairman of the organizing committee, Timo Vesala, 18.06.2007 → 20.06.2007, Finland

Marie Curie - iLEAPS: Training Course - Measurements, Hyttälä field station, organizer, Timo Vesala, 07.05.2007 → 12.05.2007, Finland

Marie Curie - iLEAPS: Training Course - Model-data assimilation, Hyttälä 10.-19.3.2008, organizer, Timo Vesala, 01.01.2007 → 31.12.2007, Finland

Physics Days 2007 (41. Annual Meeting of the Finnish Physical Society), Tallinn 15.-17.3.2007, program committee, Timo Vesala, 01.01.2007 → 31.12.2007, Finland

Workshop on eddy covariance flux measurements of CH₄ and N₂O exchanges, Hyttälä 8.-11.4.2008, member of the organizing committee, Timo Vesala, 01.01.2007 → 31.12.2007, Finland

10th Anniversary Euroflux workshop 10.-12.12.2008, Hyttälä, chairman of the organizing committee, Timo Vesala, 01.01.2008 → 31.12.2008, Finland

Greenhouse gases and aerosols: Interactions between northern ecosystems and climate, International conference given by the NECC and BACCI Nordic Centres of Excellence, Reykjavik, Iceland, June 16 18, 2008, member of the scientific committee, Timo Vesala, 01.01.2008 → 31.12.2008

ICOS, member of the Core Team, Timo Vesala, 01.01.2008 → 31.12.2008

New opportunities for Finnish-Japanese cooperation in urban land-atmosphere and air quality research, seminar held in Kumpula 24.-25.11.2008, member of the scientific committee, Timo Vesala, 01.01.2008 → 31.12.2008, Finland

Suomalainen Tiedeakatemia 100 vuotta 2008, Symposium Maan ytimeä avaruuteen, member of the program committee, Timo Vesala, 01.01.2008 → 31.12.2008, Finland

Workshop Eddy Covariance 2008, Hyttälä, April 8 11, chairman of the organizing committee, Timo Vesala, 01.01.2008 → 31.12.2008, Finland

Chair of COST Action, Timo Vesala, 2010 → ..., Finland

Executive Board Member, Timo Vesala, 2010 → ..., France

Steering group member, Timo Vesala, 2010 → ..., France

Steering group member, Timo Vesala, 11.2010 → 12.2010, Sweden

Douglas Worsnop ,

Atmospheric Chemistry Gordon Conference, Douglas Worsnop, 2005

Fellow of the American Association for the Advancement of Science, Douglas Worsnop, 2006

Atmospheric Chemistry Gordon Conference, Douglas Worsnop, 2007

Fellow of the American Geophysical Union, Douglas Worsnop, 2007 → ...

Awards Committee, Douglas Worsnop, 2008 → ...

Sergej Zilitinkevich ,

Academia Europaea (Earth and Cosmic Sciences Section), Sergej Zilitinkevich, 01.01.2006 → 31.12.2006, United Kingdom

American Biographical Institute, Consulting Editor, Sergej Zilitinkevich, 01.01.2006 → 31.12.2006, Sierra Leone

BWW Society / Institute for Advancement of Positive Global Solutions, Distinguished Professor, Sergej Zilitinkevich, 01.01.2006 → 31.12.2006, United States

Co-ordination Board of NERC Centre for Polar Observation and Modelling, Sergej Zilitinkevich, 01.01.2006 → 31.12.2006, United Kingdom

Committee for the Vilhelm Bjerknes Medal (European Geoscience Union), Sergej Zilitinkevich, 01.01.2006 → 31.12.2006

Geophysical Society of Georgia, Honorary Foreign Member, Sergej Zilitinkevich, 01.01.2006 → 31.12.2006, Georgia

NATO Advanced Research Workshop, Atmospheric Boundary Layers: Modelling and Applications for Environmental Security, held in Dubrovnik, Croatia, 18.-22.4.2006, member of the organizing committee, Sergej Zilitinkevich, 01.01.2006 → 31.12.2006

Royal Meteorological Society, Fellow, Sergej Zilitinkevich, 01.01.2006 → 31.12.2006

SABLE Workshop. Sedona, AZ, USA (Arizona State University / Army Research Lab). Nov. 12-16, 2006, member of the Organising Committee, Sergej Zilitinkevich, 01.01.2006 → 31.12.2006, United States



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Summer School on Air-sea Interaction, Helsinki, 28.8.-1.9.2006, member of the organizing committee, Sergej Zilitinkevich, 01.01.2006
→ 31.12.2006, Finland

Membership or other role in public Finnish or international organization

Miikka Dal Maso ,

HELAC Helsinki Aerosol Consulting Ltd, Modelling Services Manager, Miikka Dal Maso, 01.01.2008 → 31.12.2010, Finland

Member of Departmental Board, Miikka Dal Maso, 2010 → ..., Finland

Nordic Association of Aerosol Research (NOSA) member, Miikka Dal Maso, 2010 → ...

Kaarle Hämeri ,

Acatiimi, Professoriliiton, Tieteentekijöiden liiton ja Yliopistonlehtorien liiton lehti, toimitusneuvosto, Kaarle Hämeri, 01.01.2007 → 31.12.2007, Finland

Board member of Union of Finnish university professors / Professoriliitto, Kaarle Hämeri, 2007 → 2010, Finland

Vice president / International Aerosol Research Assembly, Kaarle Hämeri, 01.01.2007 → 31.12.2010

President / Finnish Association for Aerosol Research, Kaarle Hämeri, 2008 → 2011, Finland

Kari Hartonen ,

SYKE, Maaperämenetelmien standardisointityöryhmä, Kari Hartonen, 01.01.2006 → 31.12.2006, Finland

Leena Järvi ,

The Finnish Association for Aerosol Research, Leena Järvi, 2006 → ..., Finland

Eija Juurola ,

Metsätieteiden laitoksen laitosneuvosto, Eija Juurola, 2010 → 2013

Markku Kulmala ,

CSC Center for Scientific Computing - Tieteellinen laskenta Oy, Markku Kulmala, 01.01.2005 → 31.12.2006, Finland

CSC Center for Scientific Computing - Tieteellisen laskennan keskus, Markku Kulmala, 01.01.2005 → 31.12.2006, Finland

Ilmatieteen laitos, johtokunnan jäsen, Markku Kulmala, 01.01.2005 → 31.12.2005, Finland

Finnish Meteorological Institute, member of the board, Markku Kulmala, 01.01.2006 → 31.12.2006, Finland

Yliopistokollegio puheenjohtaja, Markku Kulmala, 01.01.2010 → 31.12.2013, Finland

Lauri Laakso ,

North-West Provinssin ilmanlaatumittausjärjestelmän kehittämisen auttaminen, Lauri Laakso, 01.01.2007 → 31.12.2007, South Africa

HELAC Helsinki Aerosol Consulting Ltd, Research Manager, Lauri Laakso, 01.01.2008 → 31.12.2008, Finland

Antti Johannes Lauri ,

Luonnontieteiden foorumi (matemaattis-luonnontieteellisten järjestöjen epävirallinen neuvotteluelin), Antti Johannes Lauri, 01.01.2006 → 31.12.2006, Finland

Luonnontieteiden foorumi (matemaattis-luonnontieteellisten järjestöjen epävirallinen neuvotteluelin), Antti Johannes Lauri, 01.01.2007 → 31.12.2007, Finland

Innovaatioputkesta yritystoimintaa - Cleantech innovaatioiden kaupallistaminen, Antti Johannes Lauri, 02.01.2008 → 31.12.2008, Finland

Luonnontieteiden foorumi (matemaattis-luonnontieteellisten järjestöjen epävirallinen neuvotteluelin), Antti Johannes Lauri, 01.01.2008 → 31.12.2008, Finland

Annikki Mäkelä-Carter ,

Member of the steering group of the Department of Forest Ecology, Annikki Mäkelä-Carter, 2005 → 03.2009, Finland

Member of the strategic planning committee of the Faculty of Agric.&For., Annikki Mäkelä-Carter, 01.2007 → 12.2009, Finland

Chair of the steering group of the Department of Forest Ecology, Annikki Mäkelä-Carter, 03.2009 → 12.2009, Finland



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ATM/Kulmala

Eero Nikinmaa ,

Asiantuntijakommentti IPCC:n 4. arviointiraportin työryhmä II:n osuuteen, Eero Nikinmaa, 15.07.2006 → 31.12.2006, Finland

MMTDK:n lausunto Suomen luonnon monimuotoisuuden suojelun ja kestävä käytön strategiaksi 2006-2016, Eero Nikinmaa, 05.12.2006 → 31.12.2006, Finland

MMTDK:n lausunto Uudenmaan ja Itä-Uudenmaan Natura-alueiden hoidon ja käytön yleissuunnitelma- ehdotukseen, Eero Nikinmaa, 05.12.2006 → 31.12.2006, Finland

Tuukka Petaja ,

Finnish Association for Aerosol Research, Tuukka Petaja, 2002 → ...

European Geophysical Union, Tuukka Petaja, 2004 → ...

American Geophysical Union, Tuukka Petaja, 2008 → ...

American Association for Aerosol Research, Tuukka Petaja, 2010 → ...

Albert Porcar-Castell ,

Member, Albert Porcar-Castell, 2004 → ...

Member, Albert Porcar-Castell, 2008 → ...

Anni Reissell ,

Joint Scientific Committee of the World Climate Research Programme (WCRP)., Anni Reissell, 06.03.2006 → 07.03.2006, India

Marja-Liisa Riekkola ,

Committee Member of Public Information, Marja-Liisa Riekkola, 2000 → 2009, Finland

Ilona Riipinen ,

HELAC Helsinki Aerosol Consulting Ltd, Executive Manager, Ilona Riipinen, 01.01.2008 → 31.12.2008, Finland

Hannu Savijärvi ,

Hydmet.Diploma-lautakunta (Ilmatieteen laitos, Palmenia), Hannu Savijärvi, 01.01.2005 → 31.12.2005, Finland

International Commission of Planetary Atmospheres and their Evolution (ICPAE), Hannu Savijärvi, 01.01.2005 → 31.12.2005

Meteorologian Professional Development (PD) -lautakunta (Ilmatieteen laitos, Palmenia), Hannu Savijärvi, 01.01.2005 → 31.12.2005, Finland

Meteorological post-graduate diploma education, Hannu Savijärvi, 01.01.2006 → 31.12.2006, Finland

Supplementary education in hydrometeorology, Hannu Savijärvi, 01.01.2006 → 31.12.2006

Mikko Juhani Sipilä ,

HELAC Helsinki Aerosol Consulting Ltd, Measurement Services Manager, Mikko Juhani Sipilä, 01.01.2008 → 31.12.2008, Finland

Hanna Vehkamäki ,

Finnish Physical Society, working group Female Physicists in Finland, Hanna Vehkamäki, 01.01.2008 → 31.12.2008, Finland

Timo Vesala ,

Geodetic-Geophysical National Committee of Finland, Timo Vesala, 01.01.2006 → 31.12.2006, Finland

The Finnish Society of Sciences and Letters, Timo Vesala, 01.01.2006 → 31.12.2006, Finland

Member, Timo Vesala, 2010 → ..., Finland

Douglas Worsnop ,

Fellow, American Association for Advancement of Science, Douglas Worsnop, 02.02.2004 → ..., United States

Board of Directors, American Association for Aerosol Research, Douglas Worsnop, 01.10.2009 → 30.09.2012, United States

Member, Finnish Society of Sciences and Letters, Douglas Worsnop, 20.12.2010 → ..., Finland



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Membership or other role of body in private company/organisation

Kaarle Hämeri ,

Professorilitto, hallitus, Kaarle Hämeri, 01.01.2007 → 31.12.2007, Finland

Aerosolitutkimusseura ry, Kaarle Hämeri, 01.01.2008 → 31.12.2008, Sweden

CLEEN / member of R&D committee, Kaarle Hämeri, 2009 → ..., Finland

Kari Hartonen ,

Suomen kemian seuran Paineiset fluiditekniikat-jaosto (ent. ylikriittiset fluiditekniikat-jaosto), Kari Hartonen, 01.01.2006 → 31.12.2006, Finland

Lauri Laakso ,

Suomen fyysikko-, matemaatikko- ja tietojenkäsittelytieteilijäliitto SMFL ry, member of the PR-committee, Lauri Laakso, 01.01.2005 → 31.12.2005, Finland

Antti Johannes Lauri ,

Suomen Matemaatikko-, Fyysikko- ja Tietojenkäsittelytieteilijäliitto SMFL ry, Antti Johannes Lauri, 01.01.2005 → 31.12.2005, United States

Tekniikan Akateemisten Liitto TEK ry, valtion valiokunta, Antti Johannes Lauri, 01.01.2005 → 31.12.2005, United States

Jäättävä tihku, hallituksen jäsen, Antti Johannes Lauri, 01.01.2006 → 31.12.2006, Finland

Suomen Matemaatikko-, Fyysikko- ja Tietojenkäsittelytieteilijäliitto SMFL ry, Antti Johannes Lauri, 01.01.2006 → 31.12.2006, Finland

Jäättävä tihku, hallituksen jäsen, Antti Johannes Lauri, 01.01.2007 → 31.12.2007, Finland

Suomen Matemaatikko-, Fyysikko- ja Tietojenkäsittelytieteilijäliitto SMFL ry, Antti Johannes Lauri, 01.01.2007 → 31.12.2007, Finland

Suomen Matemaatikko-, Fyysikko- ja Tietojenkäsittelytieteilijäliitto SMFL ry, Antti Johannes Lauri, 01.01.2008 → 31.12.2008, Finland

Eero Nikinmaa ,

Poikkipuolalaisen, Tervalammen ja Huhmarjärven vesiensuojeluyhdistys, Eero Nikinmaa, 01.01.2006 → 31.12.2006, Finland

Mari Pihlatie ,

Jäättävä tihku, Mari Pihlatie, 01.01.2006 → 31.12.2006, Sweden

Janne Rinne ,

Ilmansuojeluyhdistys, Ilmansuojelu-Uutiset lehden toimituskunnan jäsen, Janne Rinne, 01.01.2007 → 31.12.2007, Belgium

Ilmansuojeluyhdistys, Ilmansuojelu-Uutiset lehden toimituskunnan jäsen, Janne Rinne, 01.01.2008 → 31.12.2008, Finland

Hanna Vehkamäki ,

Finnish Physical Society, working group Female Physicists in Finland, Hanna Vehkamäki, 01.01.2007 → 31.12.2007, United Kingdom

Participation in interview for written media

Kaarle Hämeri ,

Fysiikan seminaari, Tampereen teknillinen yliopisto, Kaarle Hämeri, 01.01.2003 → 31.12.2011, Finland

Helsingin yliopisto, Kaarle Hämeri, 01.01.2003 → 31.12.2011, Finland

Studia Generalia, Kuopio, Kaarle Hämeri, 01.01.2003 → 31.12.2011, Finland

Universitas Helsingiensis 2/2004, Kaarle Hämerin haastattelu, Kaarle Hämeri, 01.01.2004 → 31.12.2011, Finland

Yliopisto-lehti 3/2004, haastattelu, toimittaja Juha Merimaa, Kaarle Hämeri, 01.01.2004 → 31.12.2011, Finland

Alueutiset, haastattelu, toimittaja Jari Pietiläinen, s. 7, Kaarle Hämeri, 06.07.2005 → 31.12.2011, Sweden

EU-parlamentti, Strasburg, Kaarle Hämeri, 11.04.2005 → 31.12.2011, Sweden

LERU Kids University, Kaarle Hämeri, 11.11.2005 → 31.12.2011, Sweden



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Suomen lääkärilehti 37/2005, haastattelu, toimittaja Suvi Sariola, Kaarle Hämeri, 01.01.2005 → 31.12.2011, Sweden
Valtakunnallinen LUMA-viikko, paneelikeskustelu koululaisille Chemicumissa, Kaarle Hämeri, 08.11.2005 → 31.12.2011, Sweden
Yliopisto-lehti 2/2005, haastattelu, toimittaja Arja-Leena Paavola, Kaarle Hämeri, 04.02.2005 → 31.12.2011, Sweden
Aamulehti, haastattelu, Kaarle Hämeri, 09.08.2006 → 31.12.2011, Finland
Aamulehti, haastattelu, toimittaja Virpi Ekholm, Kaarle Hämeri, 16.11.2006 → 31.12.2011, Finland
Helsingin Sanomat, haastattelu, toimittaja Elsa Tuppurainen, Kaarle Hämeri, 03.12.2006 → 31.12.2011, Finland
Helsingin yliopiston kotisivut, Tiede & tutkimus, Viikon tiedeuutinen, Kaarle Hämeri, 01.01.2006 → 31.12.2011, Finland
STT, haastattelu, Kaarle Hämeri, 15.11.2006 → 31.12.2011, Finland
Uutispäivä Demari, haastattelu, toimittaja Olli Hela, Kaarle Hämeri, 21.11.2006 → 31.12.2011, Finland
Allergiayhdistyksen seminaari, Kaarle Hämeri, 11.11.2008 → 31.12.2011, Sweden
SMEAR and Atmospheric Nucleation 50th Anniversary Seminar of Academy Prof. Markku Kulmala, Kaarle Hämeri, 30.10.2008 → 31.12.2011, Sweden

Eija Juurola ,

Haastattelu Kauppalehti Presso -lehdessä, Eija Juurola, 05.11.2005, France
Haastattelu tieteessä tapahtuu palstalle Yliopistolehti 9/2005, Eija Juurola, 01.10.2005, France

Petri Ilkka Rinaldo Keronen ,

Yliopisto-lehti 13/2005, haastattelu, toim. Mikko Puttonen, Petri Ilkka Rinaldo Keronen, 18.11.2005 → 31.12.2011, Finland

Markku Kulmala ,

Helsingin Sanomat 12.11.2000, s. D 2, haastattelu toimittaja Anu Uimosen artikkelissa "Hyvien hiukkasten herra", Markku Kulmala, 01.01.2000 → 31.12.2011, Finland
Yliopisto - Acta Universitatis Helsingiensis 16/2000, haastattelu toim. Satu Elon artikkelissa "Bensaa suonissa", s. 12-13, Markku Kulmala, 01.01.2000 → 31.12.2011, Finland
Helsingin Sanomat, Markku Kulmala, 17.06.2001 → 31.12.2011, Sweden
Helsingin Sanomat, haastattelu, Markku Kulmala, 13.06.2001 → 31.12.2011, Sweden
Helsingin yliopisto, Ilmakehätieteiden osasto, avajaiset, Markku Kulmala, 07.09.2001 → 31.12.2011, Sweden
Uutta ympäristötutkimuksessa ja -analytiikassa, Suomen Kemian Seuran täydennyskoulutuskurssi, Fortum Oil and Gas Oy, Keilaniemi, Markku Kulmala, 03.10.2001 → 31.12.2011, Sweden
Valtiosihteeri Raimo Sailaksen ja kansliapäällikkö Erkki Virtasen vierailu Hyytiälän metsäasemalla, Markku Kulmala, 28.05.2001 → 31.12.2011, Sweden
Vihkiäissymposium ja alumnipäivä, Physicum, Markku Kulmala, 06.09.2001 → 31.12.2011, Sweden
Ympäristöministeriö, Ilmastotoimikunta, Markku Kulmala, 23.10.2001 → 31.12.2011, Sweden
Helsingin Sanomat, Tiede, haastattelu, toim. Annikka Mutanen, s. C 18, Markku Kulmala, 14.12.2002 → 31.12.2011, Norway
Yliopisto 19/2002, haastattelu, toim. Virve Pohjanpalo, Markku Kulmala, 01.01.2002 → 31.12.2011, Norway
Helsingin Sanomat, haastattelu, Markku Kulmala, 19.11.2003 → 31.12.2011, Finland
Itä-Helsingin Uutiset, haastattelu, Markku Kulmala, 23.11.2003 → 31.12.2011, Finland
Metsälehti, haastattelu, Markku Kulmala, 18.12.2003 → 31.12.2011, Finland
Tieteen päivät, esitelmä, Markku Kulmala, 10.01.2003 → 31.12.2011, Finland
Universitas Helsingiensis, Quarterly magazine 2/2003, haastattelu, toim. Virve Pohjanpalo, s. 18-20, Markku Kulmala, 01.01.2003 → 31.12.2011, Finland
Vaihtoehtojen yliopisto -keskustelutilaisuudessa väittelevät vastakkain professori Riitta Keiski ja professori Markku Kulmala, Yliopiston päärakennuksen Runeberg-sali, Markku Kulmala, 04.11.2003 → 31.12.2011, Finland
Helsingin yliopiston tutkimus- ja kehitysoikeus, Cutting-edge research, Markku Kulmalan haastattelu, Markku Kulmala, 09.12.2004 → 31.12.2011, Austria
Karjaan suomenkielinen kansalaisopisto, Markku Kulmala, 04.11.2004 → 31.12.2011, Austria



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Kemia-lehti 7/2004, Markku Kulmalan haastattelu, Markku Kulmala, 01.01.2004 → 31.12.2011, Austria
Puhuri (Ilmatieteen laitoksen henkilöstölehti) 5/2004, Markku Kulmalan haastattelu, Markku Kulmala, 01.01.2004 → 31.12.2011, Austria
YLE Teema, Tutkittu juttu -sarja, Markku Kulmala, 01.01.2004 → 31.12.2011, Austria
Yliopisto-lehti, nro 3/2004, haastattelu, toim. Esa Mäkinen, Markku Kulmala, 01.01.2004 → 31.12.2011, Austria
Biologian ja maantieteen opettajien liitto BMOL ry:n syyspäivät, Markku Kulmala, 15.10.2005 → 31.12.2011, Finland
CSCnews-lehti 4/2005, s. 10-12, haastattelu, toimittaja Leena Jukka, Markku Kulmala, 01.01.2005 → 31.12.2011, Finland
Forssan lehti, haastattelu, Markku Kulmala, 06.03.2005 → 31.12.2011, Finland
Helsingin yliopiston hallintoviraston yleishallinnon kehittämispäivä, Markku Kulmala, 13.10.2005 → 31.12.2011, Finland
MikroPC-lehti 7/2005, haastattelu toimittaja Juha Haatajan kolumnissa, s. 19, Markku Kulmala, 01.01.2005 → 31.12.2011, Finland
Palmenian syyspäivä, Markku Kulmala, 04.10.2005 → 31.12.2011, Finland
Studia Generalia, Helsingin yliopisto, Markku Kulmala, 06.10.2005 → 31.12.2011, Finland
Tieteen tietotekniikan tietoyhteys 2/2005, haastattelu toim. Leena Jukka, Markku Kulmala, 01.01.2005 → 31.12.2011, Finland
YLE teema, tutkittu juttu, uusinta, Markku Kulmala, 03.10.2005 → 31.12.2011, Finland
YLE teema, tutkittu juttu, uusinta, Markku Kulmala, 07.10.2005 → 31.12.2011, Finland
Yliopistolainen 5/2005, haastattelu, toim. Reetta Vairimaa, Markku Kulmala, 01.01.2005 → 31.12.2011, Finland
Kristillisdemokraattinen viikkolehti, tiedeuutinen, Markku Kulmala, 07.09.2006 → 31.12.2011, Finland
Yliopisto-lehti 6/2006, lyhyt haastattelu, Markku Kulmala, 15.05.2006 → 31.12.2011, Finland
Excellence Stems from People, international conference, Markku Kulmala, 27.08.2007 → 31.12.2011, Finland
Excellent Stems from People, conference, Turku, Markku Kulmala, 27.08.2007 → 31.12.2011, Finland
Google Alerts, worldwide internet information, http://www.eurekalert.org/pub_releases/2007-11/uoh-wam111507.php, Markku Kulmala, 15.11.2007 → 31.12.2011, Finland
Helsingin Sanomat, nettisivu www.hs.fi, referointi kansainvälisesti arvostetun tiedelehden Science Expressin tuoreessa numerossa ilmestyneestä akatemiaprofessori Markku Kulmalan johtaman ryhmän tutkimuksista, Markku Kulmala, 31.08.2007 → 31.12.2011, Finland
Helsingin kaupungin verkkosivu, uutislinkki, Markku Kulmala, 23.01.2007 → 31.12.2011, Finland
Tieteen päivät '07, Markku Kulmala, 10.01.2007 → 31.12.2011, Finland
YLE X, uutiset, Markku Kulmala, 22.01.2007 → 31.12.2011, Finland
Yliopisto 12/2007, tiedeuutishaastattelu, Markku Kulmala, 17.12.2007 → 31.12.2011, Finland
Yliopisto-lehti 9/2007, lyhyt referointi kansainvälisesti arvostetun tiedelehden Science Expressin tuoreessa numerossa ilmestyneestä akatemiaprofessori Markku Kulmalan johtaman ryhmän tutkimuksista, s. 9, Markku Kulmala, 17.09.2007 → 31.12.2011, Finland
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Helsinki University Bulletin 1/2008, interview by Meri Siippainen, Timo Vesala, 01.01.2008 → 31.12.2011, Finland

Hufvudstadsbladet, intervju, redaktör Erik Wahlström, s. 33, Timo Vesala, 06.01.2008 → 31.12.2011, Finland

Jyväskylän Kesän Uusiutuva energia -seminaari, Jyväskylä, Timo Vesala, 08.07.2008 → 31.12.2011, Finland



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Kaleva, tiedeuutinen, Timo Vesala, 03.01.2008 → 31.12.2011, Finland

Länsi-Uusimaa, tiedeuutinen, Timo Vesala, 03.01.2008 → 31.12.2011, Finland

OP-Pohjola -ryhmän palkansaajafoorumi, Kuusankoski, populaari kutsuesitelmä, Timo Vesala, 23.10.2008 → 31.12.2011, Finland

Online edition of India's National Newspaper, The Hindu, <http://www.hindu.com/seta/2008/01/10/stories/2008011050191400.htm>, Timo Vesala, 10.01.2008 → 31.12.2011, Finland

Savon Sanomat, tiedeuutinen, Timo Vesala, 03.01.2008 → 31.12.2011, Finland

Sodankylän observatorion 100-vuotisjuhlaseminaari, kutsuttu esitelmä, Timo Vesala, 07.10.2008 → 31.12.2011, Finland

Yliopisto-lehti, haastattelu, toimittaja Meri Siippainen, Timo Vesala, 20.03.2008 → 31.12.2011, Finland

Yliopisto-lehti, tiedeuutinen, Timo Vesala, 25.01.2008 → 31.12.2011, Finland

Interview in the newspaper, Timo Vesala, 29.08.2010, Finland

Letter to Editor (newspaper), Timo Vesala, 13.07.2010, Finland

Participation in radio programme

Mikael Kristian Ehn ,

Radio Vega, ohjelma Kvanthopp, haastattelu, Mikael Kristian Ehn, 09.09.2006 → 31.12.2011, Ireland

Markku Kulmala ,

YLEn aikainen, Radio Suomi, tunnin kontaktiohjelma, jossa kuuntelijat ja katsojat saivat esittää kysymyksiä, Markku Kulmala, 05.10.2005 → 31.12.2011, Finland

Yle, Radio Suomi, Tiede uutiset, Markku Kulmala, 11.08.2005 → 31.12.2011, Finland

Radio Suomi, Aamun peili, Markku Kulmala, 22.01.2007 → 31.12.2011, Finland

Swedish Radio, Markku Kulmala, 20.02.2010, Sweden

Theo Christian Kurten ,

Radio Vega, haastattelu, Theo Christian Kurten, 31.10.2007 → 31.12.2011, Finland

Radio Vega, haastattelu/radiovälttely, Theo Christian Kurten, 10.09.2007 → 31.12.2011, Finland

Radio Vega, ruotsinkielinen haastattelu, Theo Christian Kurten, 29.01.2008 → 31.12.2011, Switzerland

Antti Johannes Lauri ,

Forschung Aktuell, Saksan yleisradion tiedeohjelma, haastattelu, Antti Johannes Lauri, 13.07.2005 → 31.12.2011, United States

Jouni Räisänen ,

Appearance on radio, 12.10.2007, Jouni Räisänen, 12.10.2007, Finland

Appearance on radio, 21.8.2007, Jouni Räisänen, 21.08.2007, Finland

Appearance on radio, 16.2.2010, Jouni Räisänen, 16.02.2010, Finland

Anni Reissell ,

YLE Radio 1, tieteen viikko-ohjelma, haastattelu Sisko Loikkanen (12.4.2006), editoija Maija Typpi, kesto 6 min 20 s, Anni Reissell, 01.01.2006 → 31.12.2011, India

YLE Radio Suomi, Tiede ja opetus, haastattelu Minttu Heimovirta (9.2.2006), Anni Reissell, 28.02.2006 → 31.12.2011, India

YLE, Radio 1, haastattelu, toimittaja Sisko Loikkanen, Anni Reissell, 19.04.2006 → 31.12.2011, India

Ilona Riipinen ,

Interview for Yleisradio, "Nainen fyysikkona", Radiaattori 2010., Ilona Riipinen, 2010

Timo Vesala ,

Radiohaastattelu Radio Suomi YLE 1, Timo Vesala, 25.09.2005 → 31.12.2011, Canada

Radiohaastattelu YLE 1, Timo Vesala, 23.09.2005 → 31.12.2011, Canada



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Radiohaastattelu, Radio Suomi YLE 1, Timo Vesala, 27.09.2005 → 31.12.2011, Canada

YLE, Radio 1, haastattelu, 28 minuuttia, Timo Vesala, 24.10.2006 → 31.12.2011, Finland

Interview in radio, Timo Vesala, 17.06.2010, Finland

Participation in TV programme

Ari Asmi ,

Yle, TV2, Telakka, keskustelemassa pilvitutkija Ari Asmi, Maan ystävä Johannes Urpelainen, ilmastoasiantuntija Riitta Larnimaa ja viestintätieteilijä Timo Rusanen, Ari Asmi, 24.07.2005 → 31.12.2011, Finland

Kaarle Hämeri ,

TV news / interview, Kaarle Hämeri, 29.07.2010, Finland

Markku Kulmala ,

Yle, TV1, haastattelu, Markku Kulmala, 07.10.2005 → 31.12.2011, Finland

YLE, TV1, Prisma Studio, haastattelu, Markku Kulmala, 19.04.2006 → 31.12.2011, Finland

MTV3 Huomenta Suomi, Markku Kulmala, 01.01.2007 → 31.12.2011, Finland

YLE TV1, A-studio, Markku Kulmala, 01.01.2007 → 31.12.2011, Finland

Nordic Atmospheric Research, Markku Kulmala, 2010, Sweden

TV1 Tutkittu juttu -sarja, Markku Kulmala, 18.11.2010 → 31.12.2011, Austria

Tuukka Petaja ,

Prisma Studio, Tuukka Petaja, 20.04.2010, Finland

Mari Pihlatie ,

Interview of Terhi Riutta and Mari Pihlatie from Siikaneva measurement site. TV2 18:00 news, Mari Pihlatie, 01.01.2005 → 31.12.2011, Sweden

Albert Porcar-Castell ,

Prisma Studio:Tulevaisuuden Metsät, Albert Porcar-Castell, 27.04.2010

Jouni Räisänen ,

Appearance in TV 17.1.2005, Jouni Räisänen, 17.01.2005, Finland

Appearance in TV, 12.10.2007, Jouni Räisänen, 12.10.2007, Finland

Appearance in TV, 16.3.2007, Jouni Räisänen, 16.03.2007, Finland

Appearance in TV, 2.2.2007, Jouni Räisänen, 02.02.2007, Finland

Appearance on TV, 12.12.2007, Jouni Räisänen, 12.12.2007, Finland

Appearance on TV, 11.12.2008, Jouni Räisänen, 11.12.2008, Finland

Appearance on TV, 23.11.2009, Jouni Räisänen, 23.11.2009

Appearance on TV, 23.9.2009, Jouni Räisänen, 23.09.2009, Finland

Appearance on TV, 3.2.2010, MTV3, Jouni Räisänen, 03.02.2010, Finland

Appearance on TV, 3.2.2010, TV1, Jouni Räisänen, 03.02.2010, Finland

Janne Rinne ,

Luonto lähellä ohjelma, YLE 1 aamu-TV, haastattelu, toim. Paul Segersvärd, Janne Rinne, 21.08.2006 → 31.12.2011, Greece

Interview as mir specialist in TV1, Janne Rinne, 27.11.2008

Taina Ruuskanen ,

TV: Yle 2, Hämeen alueuutiset, haastattelu, Taina Ruuskanen, 11.08.2005 → 31.12.2011, Finland



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Timo Vesala ,

MTV3 Seitsemän uutiset, Timo Vesala, 31.05.2007 → 31.12.2011, United Kingdom

TV 4, uutiset, haastattelu Nature-artikkelin johdosta, Timo Vesala, 01.01.2008 → 31.12.2011, Finland

TV1 Prisma-tiedeohjelma, Timo Vesala, 02.04.2008 → 31.12.2011, Finland

YLE TV1, uutiset ja sää 20:30, Timo Vesala, 02.01.2008 → 31.12.2011, Finland

Interview in TV, Timo Vesala, 17.06.2010, Finland

Participation in interview for web based media

Jouni Räisänen ,

Helsingin yliopiston nettisivu "Ajankohtaista", haastattelu, toimittajat Minna Meriläinen ja Tapani Sainio, Jouni Räisänen, 01.01.2008 → 31.12.2008, France

Interview for web based media, August 2008, Jouni Räisänen, 24.08.2008, Finland

Ilona Riipinen ,

Interview for University of Helsinki's web advertisement "Tieteen näkökulma", Ilona Riipinen, 2009



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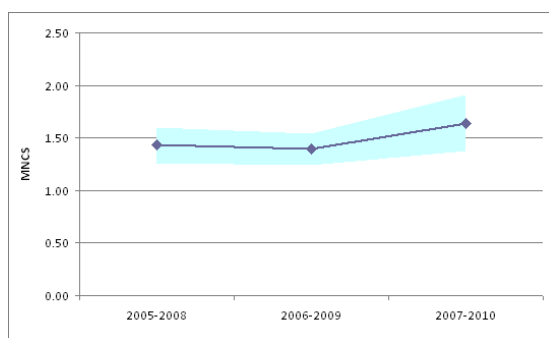
Web of Science(WoS)-based bibliometrics of the RC's publications data 1.1.2005-31.12.2010
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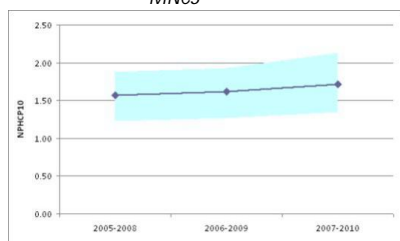
Basic statistics

Number of publications (P)	692
Number of citations (TCS)	4,980
Number of citations per publication (MCS)	7.23
Percentage of uncited publications	22%
Field-normalized number of citations per publication (MNCS)	1.56
Field-normalized average journal impact (MNJS)	1.37
Field-normalized proportion highly cited publications (top 10%)	1.59
Internal coverage	.82

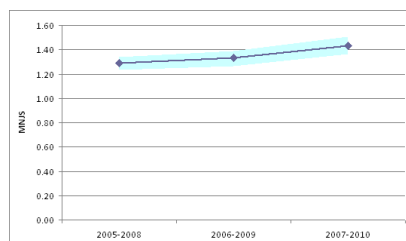
Trend analyses



MNCS

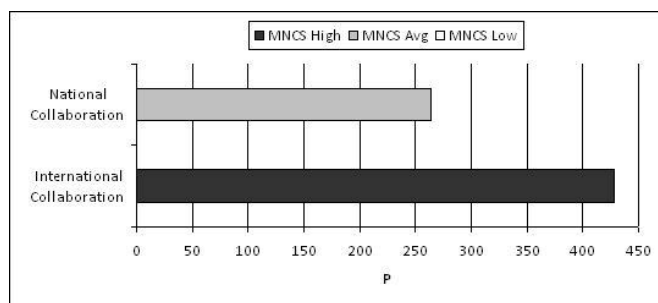


THCP10



MNJS

Collaboration



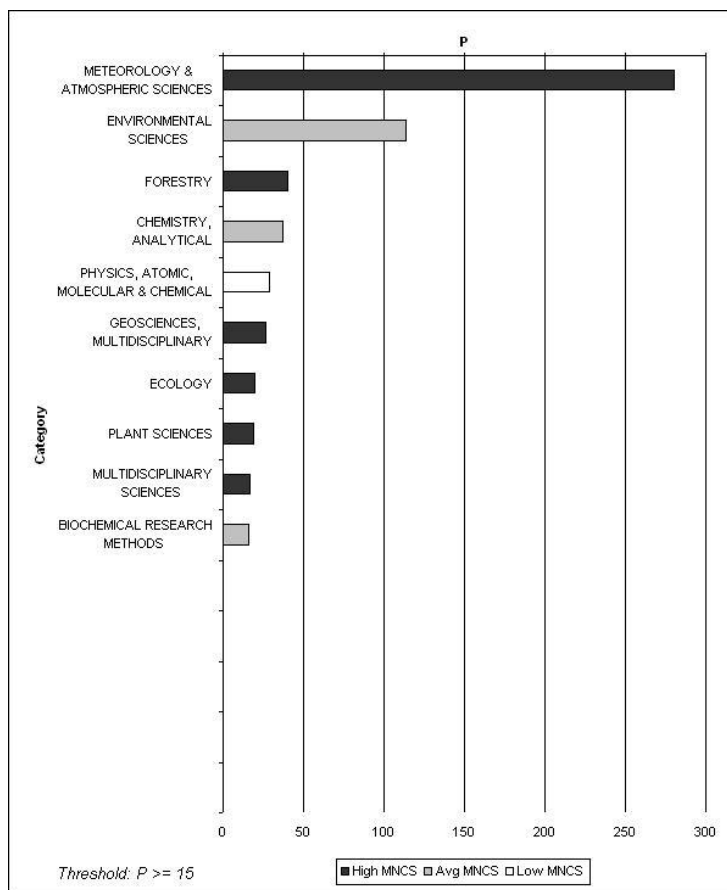
Performance (MNCS) by collaboration type



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